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R. H. STINCHFIELD, *Editor*

Editorial Office: 1155 16th Street, N. W., Washington 6, D. C.

VOLUME XXXIII NO. 1

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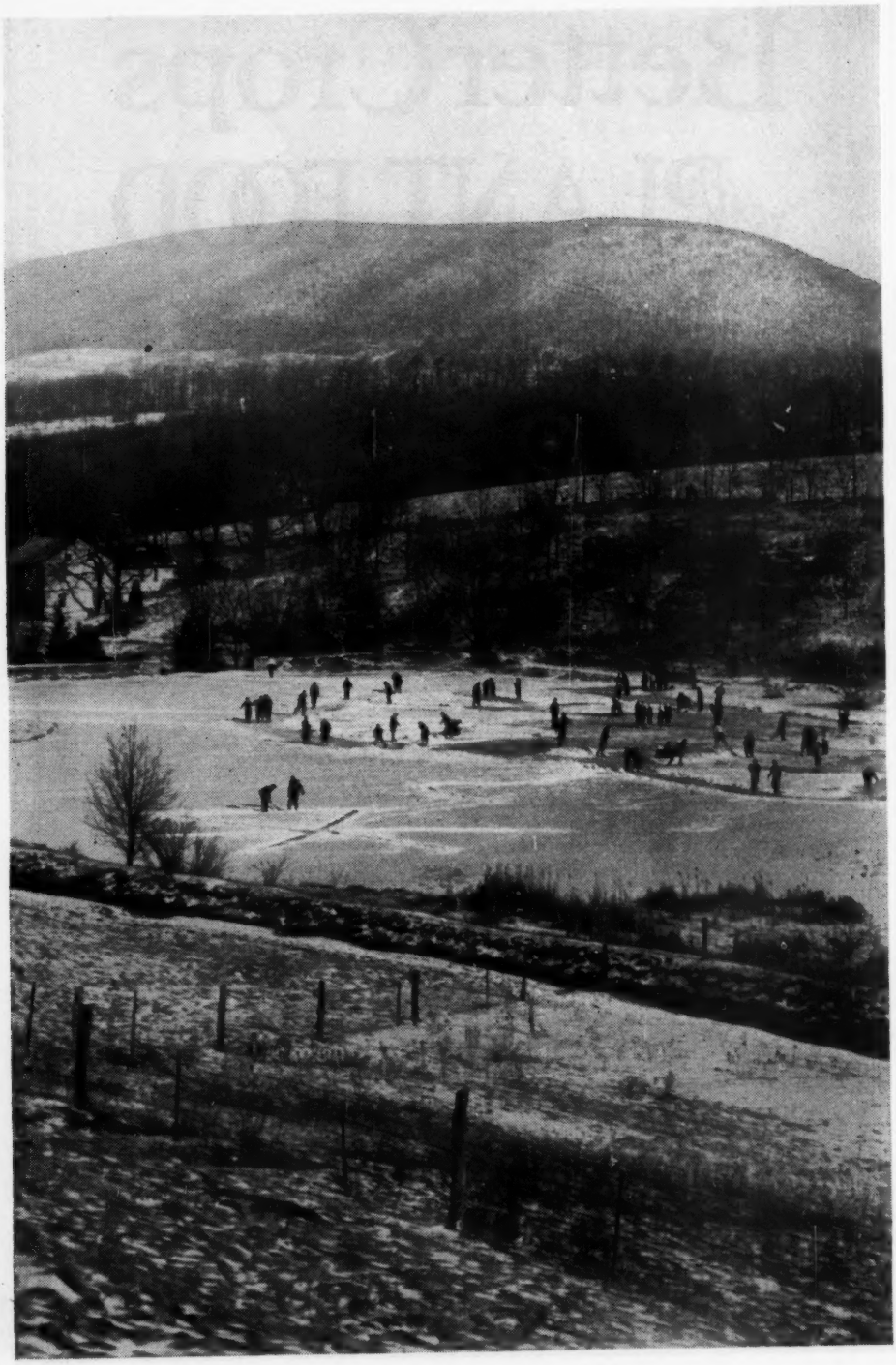

A country pond provides good skating.

Better Crops with PLANT FOOD

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VOL. XXXIII WASHINGTON, D. C., JANUARY 1949 No. 1

A Tribute to . . . .

Farm Listening Posts

Jeff McDermid

FAR less publicity has been given through the years to agriculture's constructive "spies and informers" than to the nation's traitorous and subversive ones. Yet there is room for such an "investigation" when we are celebrating the completion of the greatest production of field crops and fruits in the history of the country.

From the volunteer farmer's note-book of neighborhood observations to the final signature of the Secretary of Agriculture behind locked doors and sealed windows in Washington runs a vital chain of monthly crop information, the like of which and the promptness and volume of which exist nowhere else in the world. The facts served up regularly to 148,000,000 food consumers in the United States are the work of only about 250,000 persons, or 1 in every 592 individuals of the population.

The year 1949 marks the 86th anniversary of the first United States official crop report, put out by Isaac Newton, chum and chess companion of Abraham Lincoln; and also of the no less important 32nd anniversary of the origin of the State-Federal cooperative crop reporting service, begun in Madison, Wisconsin, and now embracing 41 state or area offices linked to the Bureau of Agricultural Economics and its Crop Reporting Board.

The first national crop report of 1863 was a meager one of eight pages. It merely recited in a sketchy way the appearance or condition of the crops and estimated their acreage in fractions more or less compared with the year

before. Contrast that humble little document with the average monthly turnout of today, cooperatively prepared by state and federal specialists, with detailed state and regional tables and discussions covering 70 pages or more. What would Uncle Isaac have said about the 1948 annual U. S. crop review wherein the cereals harvested amounted to about 180 million tons? Probably they couldn't count up to a million in those days, either in fact or imagination, and the mathematical chore of totaling such monstrous weights and measures would have been utterly beyond their capacity. Moreover, nobody would have believed them, had they done it.

This modern trust and reliance upon the factual data dished up by the knowing sleuths of the fields are just as remarkable in their way as the gathering of the data. But if there is any criticism heard as the crop report echoes die away, it usually pertains to the understatement aspects of a crop failure or a record harvest. That is, there will be grumbling that the good news wasn't made good enough or the bad news wasn't overstated, rather than the reverse.

RIGHT here it's fair enough to paraphrase a familiar quotation of some sage about foods. It has been said that "digestion waits on appetite and health on both." Just as truly might it be recited that "good judgment waits on information and success on both." The cycle of good judgment runs from the single farmer or groups of farmers scanning the stubble fields and the haylands through the mazes of the crop estimate right down to its publication—and then, of course, such facts aid the farmer again to use the sound judgment in planting and harvesting which spells his season's results, barring accident or natural disaster. Thus there is a chain of wisdom and experience hitched to the drive wheels of agricultural industry, ready to receive oil or fuel, and ready to slow down or accelerate. If we had no crop report there would be something far greater missing than jobs for so-called "bureaucrats."

One criticism of the far-flung crop reports which we used to hear bruited about is something that seldom "crops up" today. I refer to the remark by one of my old Germanic farmer friends of the Midwest in days of considerable yore that "we don't need them there farm staticks any longer and should quit putting them out. They joost give them darn middlemen and speculators a chance to gamble mit our profits."

Today with agriculture connected firmly to industry, commerce, labor, and consuming households, as well as starving foreigners, we know that blind guesswork is a menace. We need only to dig up that historic statement that went with the nation's first crop report:

"Ignorance of the state of our crops," said Uncle Isaac, "invariably leads to speculation, in which oftentimes, the farmer does not obtain just prices and by which the consumer is not benefited." But it was not until many years later that prices became an integral part of the Government's farm information schedule, thanks to the nerve and persistence of Nat Murray, pioneer fieldman. And now, bear in mind, the monthly agricultural price report issued each 29th day is eagerly watched and used as the basis of legislation as well as organized farm merchandising. If we had no price lists and income estimates, or lacked facts as to the value of things farmers use to keep their operations running, all this "parity" talk would be a far greater problem than it is—and that's saying a mouthful.

YET had it not been for the volunteer services of a host of everyday farmers, doing their "figgerin" sometimes after a hard day's work and on Sundays, neither crop nor price estimates would have a ghost of a show to exist. No set of "hired hands" sent afield briefly to make hurried surveys can ever expect to reflect the facts and conditions, the opinions and the trends,

like the fellows who make their homes on the land. They are the root of its vigor.

But the best way to get the proper slant on the contribution these unsung and obscure farm correspondents make to crop and livestock reporting is to realize what kind of fellows they usually are.

Some of the up-and-coming leaders of agriculture have been too much engrossed with cooperative or personal undertakings to spare any time to un-

paid and often "thankless" duties. We can dismiss these men from the crop picture, even though they probably contributed well to other noteworthy programs affecting farm life.

The types of farmers I have in mind as ideal examples of the regular contributors to national crop intelligence may best be understood by personal mention, without apologies to anybody or permission to make them Exhibit A.

Come with me to visit Uncle Everett Martin, a southeastern Wisconsin farmer. He has resided on the old homestead for a lifetime. He has not been the hero of any drama wherein a girl is rescued in the nick of time by "Uncle Josh" from a miserable scoundrel who holds a vicious mortgage on the ancestral acres. No, there has been no mortgage to disturb the serenity of Uncle Everett's career, and his debts are paid out of the income from a splendid Holstein herd and a maple sugar camp.

In his wall-papered "study" off the kitchen he keeps a drawer or two filled with ancient records. He brings them to the oil-cloth table top and lays them down. Therein are rows of patient figures for every day of every year since 1875. He uses them to refresh his memory of deals in town and goods bought and well used, of long summer days afield with the larks and the bees, of snappy winter nights in the stable, and fresh spring days down in the sugar bush beside his sap pans. If you really want an index of "parity" he has it.

Not only is he a hard-headed economist hatched in the times before colleges granted any such degrees, but he is a sentimentalist also. In the midst of his reams of records and basic factual data, he will brush aside a stray tear for the days that are gone and the triumphs of fair seasons achieved. Life has been serious with him and also precious and thrilling, although most of his experiences have been among old friends and familiar places.

Needless to add, during many of those years he has been a faithful crop reporter. For awhile he sent his "dope" to Washington direct, but after World War I a system was perfected so that his reports went first to the statehouse and were tabulated and revised and pooled with those from several hundred reporters like him before an estimate for the state was submitted to national headquarters.

ANOTHER and a younger farmer comes to mind. He was one of the first "pig club" boys back before 4-H contests were rampant. He was proud of his farmstead and his community, but technical agriculture came first in his dreams ahead of all group endeavors—and so he made an ideal crop observer to turn loose on local gleanings.

Then there was Samuel Webster who began making crop reports for the Government in 1885 and was hard at it on his 85th birthday. He made monthly and sometimes extra special

(*Turn to page* 49)

Fig. 1. A crop of rye, sweet clover, alfalfa, or grass plowed under gives new life to worn and depleted soils. Nitrogen fertilizer plowed under with rye or grass crops will hasten the rotting process.

Organic Matter Puts New Life in Old Soils

By C. J. Chapman

Soils Department, University of Wisconsin, Madison, Wisconsin

LAST fall as I was walking over a farm with the owner, we came to a field where the hired man was plowing under a tremendous growth of mixed sweet clover, alfalfa, and timothy. The owner told me that he had not harvested even the first crop of hay but had saved it for plowing under in the fall as a source of organic matter and humus. We stood there and watched the tractor make several rounds. The plows were doing a marvelous job of turning under this tangled mass of vegetation. It was a good sight to see; it made me feel that here at least was one farmer who really appreciated the importance of restoring his soil with this life-renewing substance—organic matter.

I know that most farmers would have taken this crop for hay. To make hay out of such a fine growth of legumes and grasses and store it in the barn for winter feed is an almost irresistible temptation. Such a crop, harvested and mowed away in the barn is the equivalent of money deposited in the bank. But to me, this

Fig. 2. Liberal applications of fertilizer at the time of seeding down will result in larger yields of grain, more straw, and larger crops of legume hay the year following. More organic matter is added to the soil.

crop of organic matter being plowed under was "money in the bank," too. Here was a good farmer, with practices in line with the teachings of such soil scientists as Professor Emil Truog and Dr. Firman E. Bear, both of whom have repeatedly stated that organic matter is a by-product of good farming.

We have been buying and applying a great deal of commercial plant food in the last five or six years. We have poured on millions of tons of lime and hundreds of thousands of tons of fertilizers, and the supply of fertilizer is still short of meeting the demand and need. Our chief objective in recent years has been to grow more feed for more cattle, hogs, and sheep. Most farmers have been harvesting "the last straw." We have been "cashing in," and I am glad that farmers have been making some money. They are entitled to this period of prosperity and good times—we have only to think back to those lean years of the early 30's when farmers literally lived up their capital investment of buildings, farm equipment, and soils as well.

But we have been drawing heavily on our soil resources during the past 6 or 7 years, not only drawing on the plant-food bank account, but burning up the organic matter. True, we have been applying great quantities of lime and fertilizer—three times the amount we were using 10 to 15 years ago! We know that the more liberal use of fertilizers and lime has resulted in bigger crops of hay and grain, more corn fodder, more straw, and more crop residues to plow under. However, we are still "cashing in" on the organic matter reserves of our soils, and have been ever since we started cropping them 75 to 100 years ago.

Just how important is organic matter in a program of long-time crop production and soil fertility maintenance? It has been said that organic matter is the life of the soil—that it is the mainspring to productive, fertile soils; and in more recent years we have been hearing a lot about its importance. A bulletin published some 3 or 4 years ago by the National Fertilizer Association, entitled "Organic Matter—the Life of the Soil," presents an excellent discussion of this subject.

Dr. G. N. Hoffer, with his articles

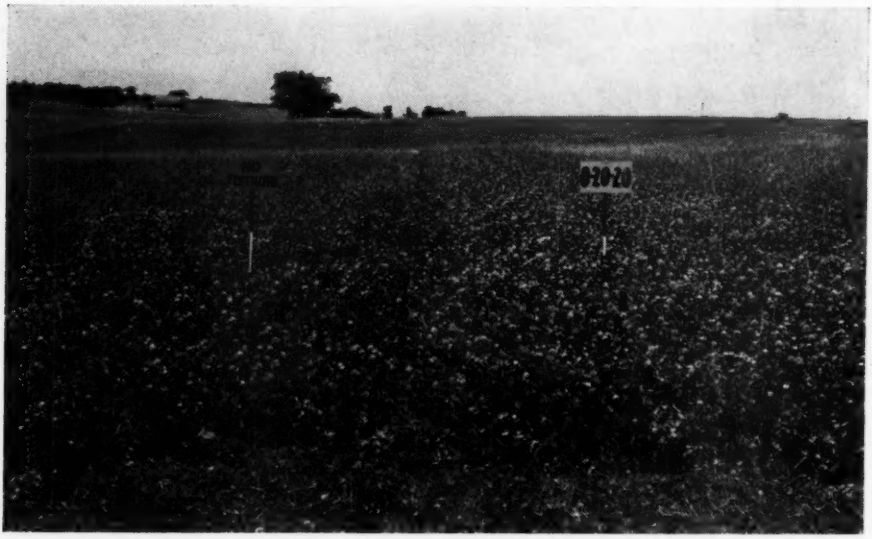

Fig. 3. Three hundred pounds of 0-20-20 fertilizer applied at the time of seeding nearly doubled the yield of grain and straw, more than doubled the yield of clover hay, doubled the amount of "fixed" nitrogen gathered from the air, and has no doubt doubled the stores of organic matter left in the soil by the roots of the grain and hay crops. In addition, a good portion of the harvested crops of grain and hay will be returned to the farm in the extra manures produced from the straw and feed.

dealing with soil ventilation, the damaging effects of soil compaction, and the depletion of organic matter supplies, and in his urging of farmers to grow a larger acreage of deep-rooted legumes which will penetrate these tight subsoils and thus improve their physical condition, has become a nationally recognized authority in this and related fields of soil fertility maintenance.

Just what is the function of organic matter? We all know that it aids in improving the physical properties of soils. Soils abundantly supplied with humus and organic matter are more friable and easier to work. There is probably no task on a farm which gives the farmer more genuine satisfaction than the plowing of land that is mellow, free-working, and friable. Certainly it is true that a soil well supplied with humus will not clod, crust, or bake so badly, and in turn, germinating seeds are better able to push through the soil in the spring.

The water-holding capacity of the soil is increased, and by increasing water intake we are reducing water runoff, thereby indirectly helping to control soil erosion.

In the decomposition of organic matter and humus we are releasing essential elements of plant food. In the rotting process, carbon dioxide is released, and this carbon dioxide combined with water forms a weak acid which helps to dissolve from the mineral constituents of our soils other plant-food elements making them available.

Authorities tell us that a soil well supplied with humus and organic matter responds more generously to treatment with commercial fertilizers. In more recent years there has been talk about "hormones" and the relationship of organic matter to these so-called growth factors which are released in the decomposition of vegetable matter in the soil.

Nitrogen, one of the most important plant-food nutrients needed in the growth of crops, is released through the decomposition of organic matter. The supply of soil nitrogen is almost

completely in organic form. Most farmers know that a dark-colored soil will usually produce a more abundant growth of crops that are darker green in color. It used to be thought that the darker the soil, the richer the soil; and this is true from the standpoint of the potential supplies of nitrogen.

What can we do to restore our worn and depleted soils with this substance we call humus and organic matter? This is a good time to start because farmers are now in a better position financially to plow in some "bank account reserves" and because we are producing more abundant crops with the present heavy use of fertilizers and lime and we really have something to plow under.

This matter of building back and maintaining a good supply of organic matter in our soils is a program we should keep at continuously over a period of years. Nevertheless, anything that we do now will have lasting effects. It is true that the organic matter we plow under decomposes rather quickly and does release most of the nitrogen and minerals it contains in a relatively short period; however, there is a residue of rather resistant material called humus, composed largely of organic carbon, that remains in the soil for long periods. The more mature the crop we plow under, the more of this resistant and long-lasting type of lignin-containing humus we add.

Here are a few suggestions for such a program: First, we must apply the plant-food elements needed to grow abundant crops. We should lime every acre of acid soil on our farms. We should take good care of stable manure, using plenty of bedding to absorb the liquid portion, and get this manure back onto the land.

Second, we should rotate our crops and follow through on soil and crop management that will hold down to a minimum losses of soil by wind and water erosion. Such management entails strip cropping, contour cultivation, crop cover, and liberal fertilization.

Third, we need to grow crops not only for the purpose of feeding our livestock but for the purpose of plowing under to restore and energize our soils. Let's not think we must harvest every blade of grass; rather, occasionally plow down a second crop of clover

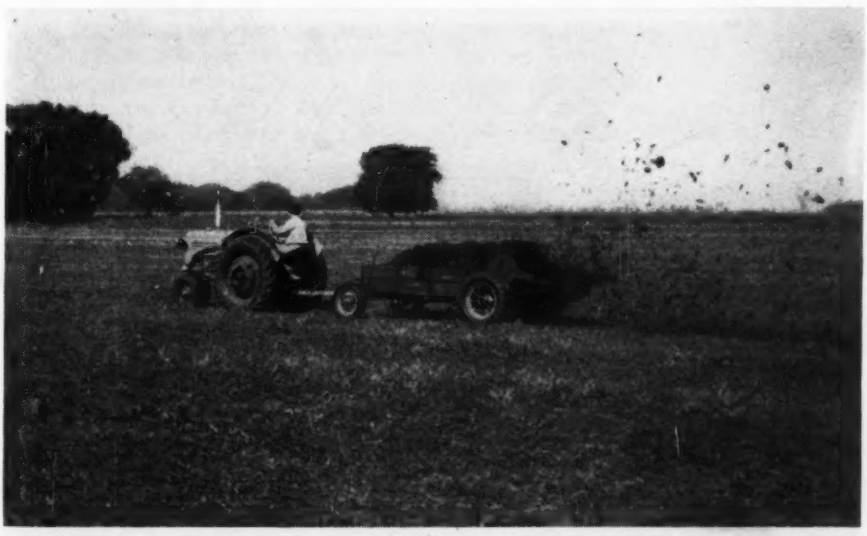

Fig. 4. Manure is an excellent source of organic matter. Under most conditions it is best to haul it directly from the barn and spread it on the fields in order that the full value of its plant-food and organic matter may be added to the soil.

or alfalfa. Better yet, grow sweet clover or other deep-rooted legumes for the sole purpose of plowing under. Whenever possible, sow catch crops such as rye, oats, or buckwheat that will serve first as protection against wind and water erosion in the fall and during the winter months, and which can be plowed under the following spring as a source of humus and organic matter.

I wish now to give expression to what I think are some common sense ideas of how far farmers should go in this matter of organic matter restoration. It's true that the average farmer will have to settle for something in between the extremes of virgin organic matter levels and complete exhaustion.

Virgin soils lose organic matter rapidly after they are broken and cropping practices started. A large part of the accumulation of humus over the period of thousands of years in our virgin prairies can be burned up within a period of relatively few years. When a virgin soil is broken and cropped, the process of decay and rotting takes place at an accelerated rate. In the words of Dr. A. G. Norman, "Bacterial fires burn very rapidly." In other words, we greatly stimulate biological activities by plowing and cultivating. "That organic matter depletion occurs," says Dr. Norman, "is not the result of poor farming but because the annual balance of organic matter in crops over expenditure is so much higher under grass than when land is under cultivation."

We should not hope to restore our soils to their virgin content of organic matter, nor is it necessary that we do so. The soils of Europe have been cultivated for over a thousand years and they are still producing good crops, that is, where given adequate amounts of lime and commercial plant foods and a program of good soil and crop management is followed. There are thousands of well-managed farms in Wisconsin where crop production is being maintained at high levels, and yet the organic-matter content of soils on these farms has been reduced a good 40% under that which they contained when the land was virgin.

At the other extreme, there are soils on farms where the organic matter has been completely burned out as a result of the combined effects of plant-food depletion and bad cropping practices.

Fig. 5. Larger crops of legumes, grasses, grain, and corn are made possible by the liming of acid soils.

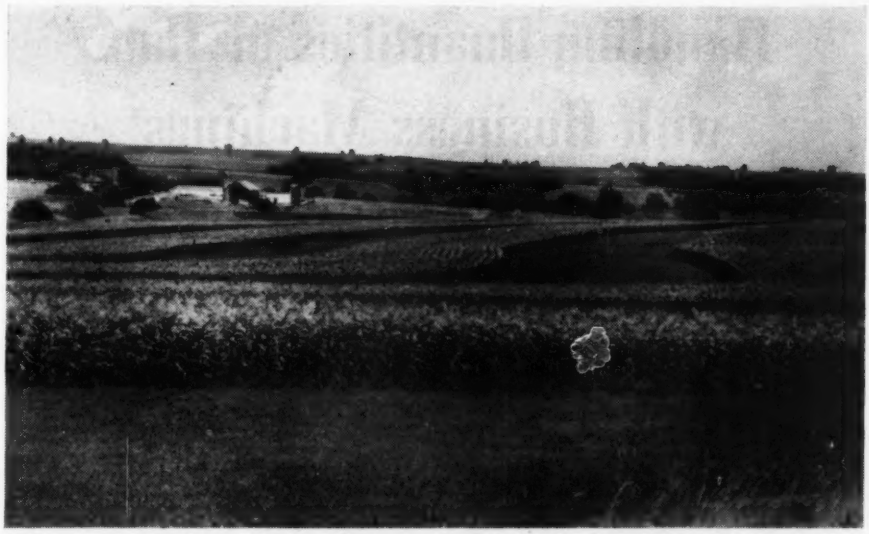

Fig. 6. Jake Voegli and his son of Lodi, Wisconsin, are holding the soils of their farm in place by this system of contour farming. They have limed every acre and have applied fertilizer at liberal rates for many years. Organic matter is being restored in the soils of their farm.

Such farms with any appreciable degree of slope have suffered heavy losses by soil erosion, too.

However, farmers are doing a better job of managing and handling their soils than they did 15 years ago. The Soil Conservation Service and the Extension Service of our colleges have been preaching and demonstrating the better practices of soil conservation and fertility maintenance. The AAA (now known as the Production and Marketing Administration) has made a tremendous contribution toward a program of soil conservation. The Federal government has made a capital investment in the future welfare of the country by this program—an investment that will pay big dividends in years to come.

A recent letter from a relative who has lived the 62 years of his life on the black prairies of central Iowa, tells me of the great interest farmers are now taking in better soil-saving practices. "Yes," he wrote, "we have farmed her hard out here in Iowa. These old soils aren't what they used to be; and you know it's hard to believe it, but the soils out here are really responding to fertilizer. We've got to come to it." He went on to say that in more recent years he and his neighbors had been plowing down clover for their corn crops.

These vaunted prairie soils of Iowa —soils which the natives used to say would never wear out—are now responding to treatment with fertilizer. Farmers are finding that fertilizers are producing substantial increases in yields of corn, grain, and hay.

We have "farmed her hard" throughout this Middle West, and the time has come when we must pour back some of the fertility that has been pumped out over the past 70 to 100 years. Evidence that farmers have drawn heavily on their soil bank account is seen in the fact that they do get these big increases in crop yields from the use of commercial fertilizers. New factories are being built all over the Middle West—7 new plants in Wisconsin, 6 or 7 new plants in the State of Iowa, and several new plants in Minnesota, Illinois, and other Midwestern states.

The great movement toward a grass-

(*Turn to page* 45)

Handling Quantities of Data with Business Machines[1]

By Ivan E. Miles[2]

State Department of Agriculture, Raleigh, North Carolina

IN testing soils and making lime and fertilizer recommendations as is done in a well-planned and efficiently operated soil-testing program, there are at least 20 major points of consideration that should be met and handled. These points of consideration cover such things as soil type, type of sample, past rotation, lime and fertilizer history, recent cover crops used, relative yield, pH, calcium, magnesium, phosphorus, potassium, exchangeable hydrogen, organic matter content, crop and rotation to be grown next, plant food and lime that will be needed, recommendations to be made as to lime and fertilizer application, management, etc. A very definite effort is being made to handle the situation along these lines in North Carolina.

When these 20 things are multiplied by a large number of samples, it requires but little imagination to realize what a task it is to handle this material in a way so as to permit the data to be computed, analyzed, and organized or arranged in any systematic way so that it can be studied, published, summarized, or otherwise helpfully used by anyone other than the farmer who received it as an individual letter.

With one year's results, it appears that the International Business Machines may be of great help in handling this situation. Attention is invited to a sample card (Fig. 1) representing an actual situation. There are not just 20 items of consideration but 45 instead. This is due to the fact that in many instances the information available is not sufficiently complete so as to definitely categorize it into the 20 major

(*Turn to page* 46)

[1] Presented to the Fertilizer Section of American Chemical Society in Washington, D. C., September 1, 1948.

[2] Now, Extension Agronomist in Mississippi.

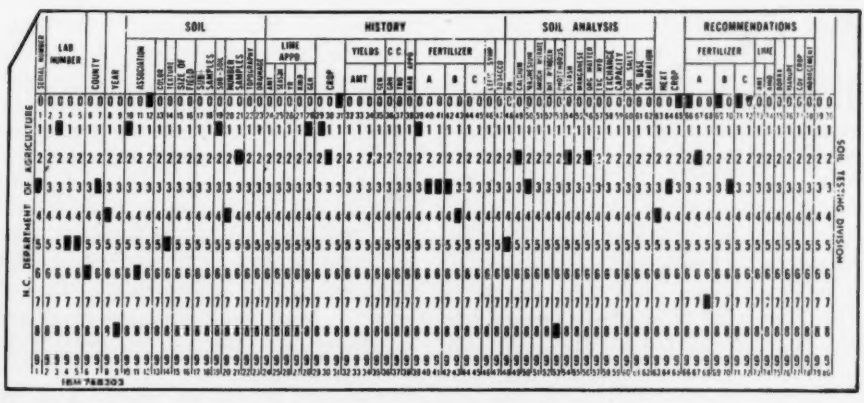

Fig. 1. A sample card showing information on 45 items regarding a soil sample from one grower.

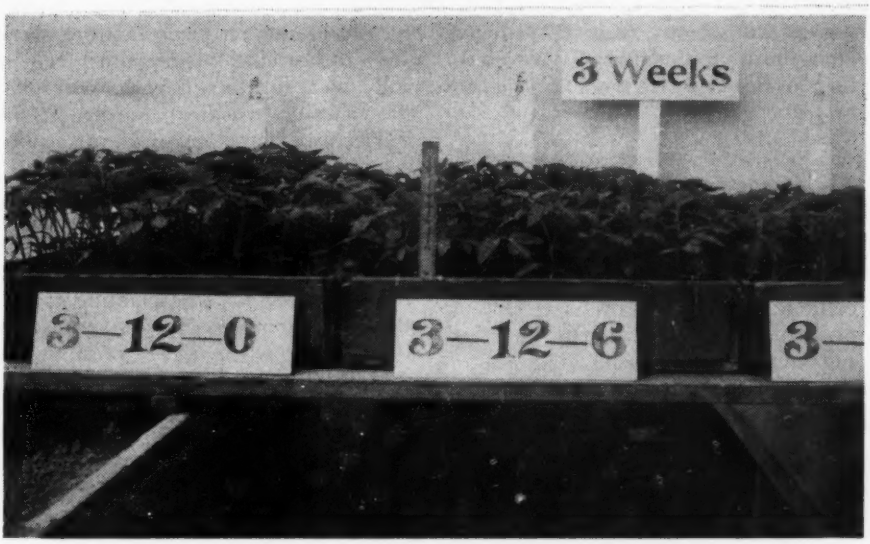

Fig. 1. Increasing amounts of potash makes firmer, stockier plants.

Hardening Plants with Potash

(Reprinted from Farm Research, October 1948)

By Charles B. Sayre

Division of Vegetable Crops, New York State Agricultural Experiment Station, Geneva, New York

IT IS well known that nitrogen fertilizers will make plants grow rapidly, and all plant growers make extensive use of nitrogen. While a rapid growth is usually desirable, especially with vegetables, there are circumstances when too rapid growth may result in plants that are too soft and tender, especially if they are to be transplanted. Also, with some crops such as tomatoes an excessive vegetative growth may delay fruit setting. Under such circumstances "hardening" the plants or checking the soft vegetative growth is desirable.

Moreover, if plants such as late cabbage plants are grown in outdoor beds, the temperature and often the water, cannot be regulated. Under such conditions one good way to "harden" plants is to fertilize them with potash. Because of the greater activity of the potash ion in the soil solution, this will balance or inhibit somewhat the uptake of nitrogen and produce plants with firmer, stiffer stems and higher carbohydrate content that will stand transplanting better.

This was illustrated in some experiments in growing tomato plants at Geneva. These plants were all grown under uniform conditions in the greenhouse and coldframes, using a regular greenhouse composted soil to which

was added various ratios of nitrogen, phosphorus, and potash. Tomato seedlings of uniform size were transplanted to flats containing different ratios of these fertilizers.

Shorter Stiffer Seedlings

Figure 1 shows three of these different treatments three weeks after the seedlings had been transplanted. Each of these flats received the same amount of nitrogen and phosphorus, but varying amounts of potash. The flat on the left received no potash. These seedlings were the largest and were very dark green and had made a soft, succulent growth. The center flat received a complete fertilizer containing 6 per cent potash. These seedlings were shorter and stiffer. The flat on the right received the same amount of nitrogen and phosphorus plus 12 per cent potash. These seedlings grew stockier and had stiffer stems and the foliage was olive green in color.

When these plants were eight weeks old (Fig. 2), at which time they were transplanted to the field, the plants without potash were 16 inches tall, dark green and had green, soft, succulent stems. Those receiving 6 per cent potash in the fertilizer mixture were 16½ inches tall and medium green in color with firm stems with some purple coloring (a sign of hardening) in the stems. The plants receiving 12 per cent potash in the fertilizer were 1 inch shorter with olive green foliage and stiff, firm stems. Expert plant growers, who were asked to judge the different lots, rated this lot as the most desirable type for transplanting to the field. Their judgment was verified by the results when these various lots were transplanted to the field. The plants that received the high-potash fertilizer required fewer replants and produced a larger crop of early tomatoes.

Success With Cabbage Plants

At the time these tomato plants were in the coldframe an extensive grower of field-grown cabbage plants came to the Experiment Station seeking advice as to how he could salvage several million cabbage plants that he feared would soon become too large and soft for transplanting before his customers would be ready for them. His predicament was this. His plants were grow-

(*Turn to page* 45)

Fig. 2. H, no fertilizer; C, 6-12-0; F, 6-12-6; and J, 6-12-12.

Fig. 1. There is still serious active erosion on military lands. This picture was taken before the area was planted to kudzu April 1948.

Military Kudzu

By T. C. Mauer

Soil Conservation Service, Spartanburg, South Carolina

KUDZU was selected and drafted to control serious erosion on military installations, and this fast-growing leguminous vine did its usual good job.

On the few installations where kudzu was accepted and planted properly under competent supervision, it is now providing excellent grazing and high-quality hay. It will continue to control erosion and provide feed for livestock if grazing is properly controlled, hay is cut at the proper time, and fertilizer is applied generously and regularly.

Time of completion was the one important factor during the construction days of 1940-43. The runoff water from bare ground, roofs, roads, parking areas, runways, aprons, and other impervious surfaces was of greater volume than usual. The topography and soil type in and around the construction sites usually added to the problems of handling these large quantities of runoff water. Much damage was done by concentrating the runoff rather than dispersing it. Even kudzu, as good as it is, should not be expected to do the impossible. A full flow through three 38-inch pipes at the top of a highly erodible plateau will cause a gully the first heavy rain. Kudzu needs help and time to overcome such a head start.

The time required to establish a complete protective cover was cut down by increasing the usual number of crowns from 500 to 1,000 per acre and using one pound of 4-12-4 fertilizer per crown. With good crowns, careful planting,

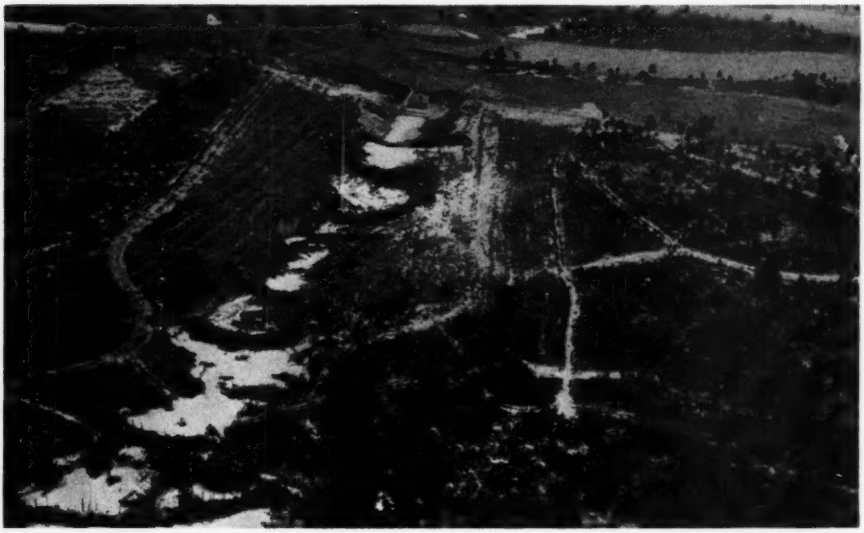

Photo by U. S. Army Signal Corps

Fig. 2. A main ditch protected by growing barriers of kudzu.

and needed cultivation a good protective cover was obtained in one growing season. Since then these same plantings, when undisturbed, have continued to provide adequate protection for which the planting was made.

Not all of the kudzu plantings were a success. Many plantings were made haphazardly, with poor preparation, no fertilizer, and no cultivation. Then, too, some of the untrained supervisory personnel looked at a kudzu crown for the first time and decided that the bud end should go down in the ground. As a result, many thousands of crowns were planted upside down. Many of the people who learned the hard way are gone. The last upside down kudzu crown planting was seen in the spring of 1948. The 5½ miles of Army road banks that would have been covered will have to be planted again next season.

In spite of the many adversities of soil, planting methods, and lack of fertilization, the estimated 5,000,000 kudzu crowns planted have done more than was expected of this erosion control crop. The lack of any maintenance is beginning to take its toll. If the original plantings had covered all the erosion problems, that part of the work would now be completed. Such is not the case. Only a few of the installations had accomplished a complete erosion control program by the end of the war in 1945. Unfortunately, these posts have now been declared surplus or are on an inactive status.

Camp Croft, Spartanburg, South Carolina, was fortunate in several respects. It was only 3 miles from the Southeastern Regional Office of the Soil Conservation Service. Many trips were made by regional technicians to help work out erosion control problems. The post engineer turned over the erosion control program to a competent and experienced conservationist who went to work at once. A half million kudzu crowns were planted on road banks, cut and fill slopes around drill fields, and on dikes between rifle ranges in the spring of 1942. The good planting methods and high rates of fertilization (1 pound of 4-12-4 per crown) gave this crop a start and kept it going.

Additional plantings of kudzu were made in 1943 and 1944 on the few remaining bare banks or ditches at Camp Croft. Where kudzu was not needed to stop severe erosion, Bermuda-grass and

annual lespedeza were used for lawns and lespedeza sericea was used on fields around the camp proper.

One of the very interesting things that resulted from the complete vegetative program established was the comment of a chaplain who spent several years at this post. "In 1942 the hospital was filled with soldiers suffering from dust colds. In 1943 there was hardly a single hospitalization for dust colds. They really kept me busy going to the hospital until the dust was settled." Soldiers can't get any training in the hospital. So vegetation was a time-saver at a critical period of the war.

Camp Rucker, Ozark, Alabama, also did a good job of erosion control. Kudzu was not accepted as readily there in the early days. One of the officers at Rucker had been in a cavalry unit. At some time in his training he was compelled to dismount and maneuver through an established stand of kudzu with his spurs still on. In spite of such an upsetting experience, kudzu was well planted and controlled erosion on many deep gullies, steep banks, and fills.

Railroad fills, built rather narrow and steep, under constant heavy use and subjected to the usual rains, made considerable extra dirt digging and hauling for filling until these banks were stabilized with kudzu. It is rather surprising that there has been no evidence of dirt slippage under the kudzu on some of the steeper fills of highly erodible soil. Kudzu has tied the soil in place with deep roots and a protective top cover.

Since many of these railroads have been out of use for some time now, the kudzu has easily grown across the top, covering ties and rails completely. This is of grave concern to those who see only the kudzu on the tracks. The good job of holding the steep banks for the last 6 years is not considered. It would seem that one engine with plenty of sand could push a boxcar through and clear the tracks. Plenty of sand will prevent slippage until the kudzu is worn off.

There are many railroad cuts and fills covered with kudzu on and off of military installations. The same good management practices should apply to both.

Anniston Ordnance Depot, Anniston, Alabama, is another military installation that has had a continuously good erosion control program. Most of the serious erosion spots were planted to kudzu in the spring of 1943. Five

Fig. 3. Cows grazing Bermuda-grass and kudzu on an "igloo."

hundred thousand crowns were planted that year. In the spring of 1948 it was arranged to pasture cattle in the "igloo" area. This arrangement has two distinct advantages. It makes practical use of the high quality feed and the cattle graze off the excess vegetative growth that would otherwise have to be mowed. Such a practical arrangement provides high-quality feed for food production and eliminates most of the need for maintenance mowing. Some mowing will have to be done around the "igloos." Doors and ventilators have to be kept free of kudzu so they can function properly. The cows are not trained to clean out such places. It might be surprising to a lot of skeptics what can be done to make the cattle graze such places more closely.

Fertilized vegetation is more palatable to cattle than that which is unfertilized. Cattle have their own way of finding such fertilized areas. So, in order to get certain areas grazed down it is only necessary to apply additional amounts of fertilizer.

Observations were made on some kudzu fertilizer plots where the applications were made at the rates of 300 pounds of phosphate and 100 pounds of potash on one plot; another plot received 600 pounds of phosphate and 200 pounds of potash. On two different farms the cattle found the plots of the higher rates and grazed them first, and then those of the lower rate.

Controlled grazing with fertilizer is a distinct possibility, particularly where there is an abundance of kudzu that is available.

In the restricted area at Anniston Ordnance Depot, there are approximately 500 acres of kudzu around and over igloos, road shoulders and banks, and borrow pits and fill slopes. Most of it is in good, thrifty growing condition. It was well fertilized when planted in 1943 but most of it has not been fertilized since. To maintain the kudzu for erosion control and provide feed for the cattle, at least one acre of kudzu should be fertilized for each animal unit to be grazed each season. Since this kudzu was fertilized 5 years ago, it is very likely that 300 pounds of phosphate and 100 pounds of potash per acre will be sufficient to attract the cattle. As a start on such a program,

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Photo by U. S. Army Signal Corps

Fig. 4. There is complete erosion control on this bank since kudzu has taken over. Note the scattering of lespedeza sericea and one patch of annual lespedeza. Maintenance of ditches and culverts is reduced to a minimum.

Fig. 1. Tall Alta fescue seeded with Ladino clover. This combination will greatly supplement permanent pasture grazing.

Permanent Pastures in South Carolina

By W. H. Craven

Agricultural Extension Service, Clemson College, Clemson, South Carolina

THE permanent pasture program of the Extension Department in South Carolina is planned each year so as to have a uniform pasture demonstration throughout the State. Eighty-seven such demonstrations have been conducted by farmers through the aid of the Extension Service from 1945 through 1947.

The results of these demonstrations clearly show that pastures have a greater animal unit-carrying capacity when a complete fertilizer is applied. The average animal unit-carrying capacity on pastures that received a complete fertilizer was 1.6 per acre.

Once a good legume sod has been established and not overgrazed, the nitrogen requirement becomes of less importance. The phosphorus, potash, and calcium requirements for optimum legume and grass growth must be supplied at least once a year and preferably twice yearly. Best results in South Carolina have been obtained from the application of 500 pounds of a 3-12-12 fertilizer in the early spring and a like amount in September, making a total application of 1,000 pounds of a 3-12-12 per acre yearly. The fall fertilization will take up when the spring application has been exhausted by the

grass and legume growth. It must be remembered that plant nutrients are essential for legume growth during the fall months.

During the past few years, farmers in South Carolina have become greatly interested in establishing and maintaining good permanent pastures. It is now a realization on their part that a good permanent pasture does not just happen, but requires adapted soils, good firm seedbed preparation, liberal fertilization including lime and basic slag, proper seeding, and good management. This realization has resulted to a large extent from the lessons taught by these pasture result demonstrations. The adage "seeing is believing" has been clearly illustrated when invariably the livestock will graze the fertilized plots constantly and leave the unfertilized check plots untouched.

These observations have also emphasized the fact that permanent pasture plants require plant nutrients the same as field-grown crops. Unfortunately, the total feed taken from an acre of good permanent pasture cannot be measured by observation as can bushels of corn or pounds of cotton per acre. The harvest from the pasture is not made in a single operation, but rather is extended over a period of 6 to 7 months. The plant-food requirements therefore become much greater when the pasture plants are constantly striving to maintain a growth toward maturity while at the same time being grazed off by the livestock.

In addition to these results from the 3-year average of the 87 permanent pasture demonstrations, farmers conducted in 1947 a total of 167 pasture demonstrations, which included 6,945 acres. This acreage furnished an average animal unit-carrying capacity of 1.68 per acre. The average number of days grazed was 209. With this long period of grazing together with supplementary grazing crops, such as our fescues, sudan grass, pearl millet, combination of velvet beans and corn or grain sorghum, annual lespedeza, kudzu, and sericea lespedeza, a year-round grazing system can be had on every farm in South Carolina.

County agents have held a large number of county tours at which farmers from all parts of the State have had an opportunity to observe the effects of

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Fig. 2. A well-established permanent pasture which has resulted from proper fertilization and good pasture management over a period of 10 years.

Fig. 1. One corner of the 1948 State Muck Crop Show held at Walkerton, Indiana.

Indiana's Muck Crops Program

By Thomas W. Higgins

Senior Student in Vegetable Crops, Purdue University, Lafayette, Indiana

"THE crops grown on the muck soils of Indiana are an important factor in Indiana agriculture," says Kent Ellis, Purdue's muck crop specialist. Mr. Ellis should know, because he has been working with Roscoe Fraser, another of Purdue's vegetable crops specialists, on the various phases of muck crop production for many years.

Indiana has 300,000 acres of drained and developed muck land at the present time. It has been a long, hard job for the muck farmer to drain and clear the swamps of northern Indiana.

Many men who saw the light in the late 1920's were looked upon with pity by other people who thought these men had lost all sense of economic stability when they began buying swamp land, which was considered absolutely useless as far as farming was concerned. Muck land could be purchased for as little as $10 an acre in those days, but today the only muck lands for sale are of estates which are being settled or acreage opened to sale by an occasional well-earned retirement of a muck land farmer. When this rich black soil is offered for sale today the average purchase price is $300 per acre.

Muck farming is work; there is more

back-breaking work in producing vegetable crops on an acre of muck than many men care to do, and for this reason most muck farmers are considered men of iron. Besides the continuous battle with the ever-present weeds, there are many other problems that arise with every crop, such as insects, pathogenic diseases, physiological diseases, nematodes, soil structure, soil fertility, varietal adaption to the land, and varietal acceptance by the consumer. All of these, plus the problems of harvesting, storing, packaging, and selling, are facing the muck land farmer yet today.

When the first vegetable crops were planted in this new soil, there were some very disappointed farmers when harvest time came. The finished product in many cases was not in demand; the cooking quality was far below the standards of vegetables that were produced on the sandy loam soils in the same areas. The yields were not above average. Many people marked muck land off the list as a soil type to produce a good crop of vegetables.

The average muck land farmer was not the kind that became discouraged easily; there were many college-trained men who were in this new business, and vast research projects, both private and public, were started. From these projects came the answer that all the muck areas of the United States were looking for.

The answer for high yields with better than average quality came with the intensive use of phosphate and potash fertilizers along with new varieties that were developed specifically for this new type of soil. The farmers are finding out for themselves that there is a direct relationship between the amount of potash they use and the yield they receive.

In the 1930's when these development projects were just beginning, there was a mutual feeling of the need of an organization where new ideas and experiences, both good and bad, could be brought together. This need was realized by Purdue University and by Roscoe Fraser, a graduate of the agricultural education division at Purdue, who had just been placed on the extension staff of the Indiana Experiment Station.

The Northern Indiana Muck Growers' Association was organized under the able leadership of Fraser cooperating with the growers of the counties that had the major muck land areas. This new association provided the type of thing that the farmers wanted.

To assemble the facts and experiences, and to provide an annual meeting for the growers, the Annual Muck Crop show was started. The show does all the things it was organized to do and has been growing bigger and better each year. It serves to stimulate increased interest in one of northern Indiana's most important natural resources—muck soil. It brings together products from this soil and gives growers a meeting place where they can see what industry is developing in the way of the latest in agricultural materials and machinery.

The Growers' Program

In 1948 the Association under the guidance of Fraser outlined a 10-point Muck Crops program for the growers as follows:

1. Grow crops adapted to your muck land and farming program; analyze each field as to soil acidity, phosphorus, and potash content, planting such crops as harmonize with the reaction and physical condition of the soil.

2. Conserve soil and maintain fertility balance by using cover crops and balanced rotations, supplemented by commercial fertilizers and soil amendments as determined by soil analyses and crop requirements.

3. Use approved varieties determined by production performance and market demands.

4. Control diseases by the use of disease-free seed or treated seed, plus the

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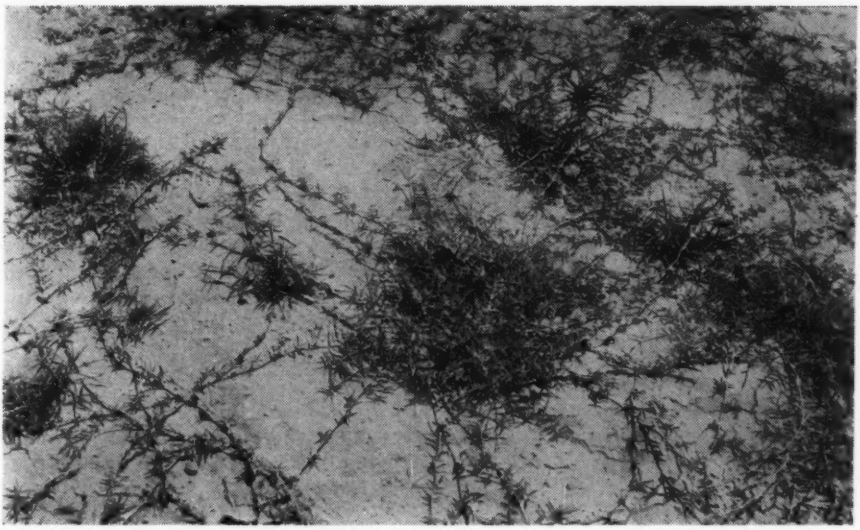

Fig. 1. Bermuda-grass spreads from a central root planting. Runners reach out in all directions and soon will have the soil solidly grassed. These runners have spread in spite of the extreme dryness of the year in which they were planted.

Establishing Bermuda-grass

By W. M. Nixon and Paul T. Gillett

Soil Conservation Service, Fort Worth, Texas

THE proper use and treatment of at least 20 million acres of land in Arkansas, Oklahoma, Louisiana, and Texas require planting Bermuda-grass. East of the native grass prairies, Bermuda is the primary base grass for permanent pastures and in addition is useful in permanent meadows, gullies, waterways, channels, farmyards and in the stabilization of highway and other embankments.

Soil Conservation Service technicians assisting soil conservation districts throughout this territory find Bermuda-grass planting the biggest conservation job in almost every conservation group. Though large amounts have already been done, the lion's share has not yet been touched. It has been estimated that to establish all of this grass needed in the Crooked Creek Soil Conservation District in North Arkansas would increase farm income there by a million dollars a year. Regional value of this one conservation job should exceed 400 million dollars a year.

Once Bermuda-grass was considered a pest. Today, many farmers have learned its value as a conservation and pasture crop. Though it is a "furriner" —a native of the Bengal region in India —it has acclimated itself here to become

a benefactor of Southern agriculture and a mainstay of conservation and permanent pastures.

Bermuda-grass Is Adaptable

Bermuda-grass is a tenacious perennial. It produces aboveground runners —stolons—that root and form crowns of new plants at nodes when in good contact with the soil, and fleshy, underground runners called rhizomes that also develop into new plants. Seed is produced too, but in most of the Western Gulf Region it is not of high quality.

Bermuda-grass produces a large amount of forage, palatable to all kinds of livestock. It is fairly nutritious in protein, phosphoric acid, and lime, particularly when fertilized properly and overseeded with legumes. It is primarily a green grazing crop; however, livestock do well on reserved winter pasturage when supplemental concentrates are fed.

Bermuda-grass prefers ample moisture and fertile soil, but it tolerates a wide range of conditions. It grows best when temperatures are high and soil moisture is good. Stolons, and sometimes rhizomes, may be killed by below-freezing temperatures; yet, under good management a dense mat of dead vegetation usually will protect the stolons, and ample soil moisture will seal the rhizomes from killing air temperatures. Sometimes, in north Oklahoma and Arkansas, close grazing, dry soil, and low temperatures combine to produce "freeze-out" spots. Most of these could be prevented by maintaining high fertility levels and by conservative use.

Other pasture plants grow well with Bermuda-grass, although because of Bermuda-grass' turfing habits, the sod may need to be torn apart occasionally to keep the desired ratio of legumes and winter-growing grasses in the stand.

Sodding and Sprigging with Companion Crops

Sodding (planting chunks of turf) and sprigging (planting dirt-free portions of rhizomes and stolons) are the surest methods of getting a stand of Bermuda-grass established. Stands established in these ways are past the vulnerable seedling stage and can reestablish themselves, if need be, from the originally planted rhizomes and stolons.

Knowing that cultivation of row crops often has spread Bermuda-grass completely over fields, many farmers have allowed row crop cultivation to sod or sprig Bermuda-grass economically.

Good Jobs of Sodding and Sprigging Require Care

Recommendations in using Bermuda include the following:

1. Prepare soil well, to encourage growth and crowning.
2. See that sod or sprigs are pressed firmly into soil to eliminate air spaces.
3. Cover deeply enough with soil to protect from drying or freezing.
4. Use enough fertilizer or soil-improving crops to support vigorous growth of the newly planted grass.
5. Keep the planting clean to eliminate moisture competition and allow stolons to crown.
6. Cultivate to cover stolons so that they will crown if soils are not naturally loose and sandy. Light grazing helps, too.

Many fields to be planted to Bermuda-grass have been depleted in fertility by years of cropping and erosion. Very poor sites should be built up for a year or two by planting legumes. Better sites can have fertilizer applied with the planting.

Harvesting Sod and Sprigs

Harvesting sod and sprigs always has been a relatively costly and time-consuming part of establishing Bermuda-grass as a conservation and permanent pasture crop.

The most common method for harvesting chunks of turf for sodding has been ordinary plowing. From time to time numerous types of sod-cutters,

Fig. 2. This highway crew is sodding Bermuda-grass for erosion control near Minden, Louisiana.

largely of the sled type, have been developed. These have had their biggest value, however, in producing slabs of turf of a uniform nature for developing a complete covering of sod for areas where large amounts of water have been concentrated, such as channels, embankments, and terrace outlets. For ordinary sodding, the turf chunks secured by plowing are most economical to get and are entirely satisfactory.

Now-outmoded hand methods of extracting sprigs from established patches of grass required nearly twice as much labor for sprig harvest as for planting, exclusive of site preparation. It was necessary to locate sources for sprig planting material in sandy areas so that the soil could be shaken easily from the sprigs. Revolving chicken-wire drums to speed up production of soil-free sprigs were devised by CCC employes and WPA crews working on erosion control work.

Recently, soil pulverizers and mulch tillers have been used effectively where there are not too many rocks or other obstructions. These machines leave the soil and grass mixed, and a side-delivery rake or other implement must be used to separate the sprigs and bunch them for loading. Some of these are large machines with their own power units; others are of garden tractor size.

Seeding Bermuda-grass

Until recently, few attempts have been made to establish Bermuda-grass by seeding. Most local seed has not germinated well. High quality seed is now produced, however, under dry-land conditions in South Texas and under irrigation in Arizona. Good seeding methods have been developed.

Bermuda-grass seeds are tiny, numbering nearly two million per pound. Successful planting requires special care and methods and suitable equipment.

Broadcast Seedings

Some of the earliest and best seedings were made by broadcasting seed in the cooled ashes, following the burning of contour windrows of brush or of well-distributed brush piles. Abundant potash, loose soil condition, freedom from choking vegetation, and warmer soil temperatures produce vigorous growth of seedlings on these ash beds. This method of seeding is especially suited to new ground and old pasture areas where there is considerable brush to be removed.

Broadcast seeding has been successful on new ground or highly fertile soils when made on firm, prepared seedbeds. Light soils, either sandy or high in organic matter, are necessary.

Broadcast seeding is not recommended for tight or poor soils.

Row Seedings and Row Seeding Equipment

By all odds, the safest way of making Bermuda-grass seedings is in rows. Soil Conservation Service Nursery Manager David H. Foster devised an attachment for any kind of smooth plate planter that makes it possible to plant small quantities of very small seed. There have been numerous field adaptations of this. Plans for the best of these are available from S.C.S. regional headquarters at Fort Worth.

Essentially, the small seed are conducted directly to one of the holes in the planting plate as it lines up with the planting slot. Thus, the seed are not ground up and jammed between plate and plate-holder. In some adaptations the funnel is replaced with a section of car radiator hose. The number and size of holes in the planting plate have to be bored in a blank plate to seed the desired quantity of seed per acre. The attachment is inexpensive. Because of the large number of different types of plate planters it is usually best to equip one particular planter with the attachment, rather than to figure on using it interchangeably on several different ones, even though they be of the same type.

In the last couple of years there have been many successful seedings made with calibrated fertilizer distributors in good condition. Seed and fertilizer are mixed thoroughly in the ratio desired, say ¾ pound of seed and 150 pounds of 4-8-12 fertilizer. This mixture is then planted through the fertilizer distributor with the distributor set for shallow soil coverage.

This method is simple, requires no special equipment, and assures fertilizer application with each seeding. Considerably more weed growth can be expected, because of the fertilizer, but no permanent damage should result unless a severe drouth develops.

A few cooperators with soil conservation districts in the cotton country have mixed small amounts of Bermuda-grass seed with linty cotton seed and have planted the mixture with an ordinary cotton planter. The cotton must be planted shallow. Satisfactory stands have been secured in this manner, and the subsequent cultivation of the cotton crop has been beneficial to the Bermuda-grass. The cotton crop raised more than offsets the small cost of grass establishment.

Essentials of Successful Seeding

To get successful seedings, the following measures are necessary:

1. Improve fertility of poor soils. Poor soils should be improved before seeding to a level that will support good grass growth. One or more years of vetch, crotalaria, or other legume green manure, with ample amounts of phosphate or complete fertilizer, may be necessary before seeding; or very poor sites may need to be planted with sod or sprigs.

2. Provide well-prepared, firm seedbed. Preparation should be well in advance of seeding time, to allow the soil to become firm. If weather permits, seeding should not be done until one or more early weed crops have come up and been destroyed by shallow tillage or harrowing. If this process has loosened the soil much, it should be firmed again by rains, rolling, or cultipacking before seeding.

3. Use light seeding rates of hulled seed. Good stands are consistently produced from one pound or less of good, hulled seed, planted in rows. Stolon growth and crowning are better where light seeding rates are used.

4. Plant Bermuda-grass seed shallow. A half-inch or less coverage is best.

5. Fertilize. Use a normal amount of nitrogenous or complete fertilizer.

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Soil Conservation Chief H. H. Bennett finds that M. M. Morris of Hope, Arkansas, not only has established a good stand of Bermuda-grass but also has raised a crop of corn on the same land. Sod or sprigs were scattered between corn rows and covered with the last cultivation. Contour tillage was used. Crops that are laid-by early are the best to use because the grass has a longer time to get set before winter. Many acres, good enough to make a useful row crop, can be set to grass economically in this way.

Above: **Farmers around Waldron, Arkansas, have developed this method of planting Bermuda-grass by feeding sod through pipes in front of wagon wheels. The wheels firmly press each chunk into the soil. Sod was plowed out and loaded on wagon by hand. Sodding is more laborious than sprigging but is usually a surer way. Although seasons with good moisture are best, with care when the ground is not frozen, sodding can be done any time of the year.**

Below: **Lon Statham, Caney Valley Soil Conservation District in Oklahoma, has put sod planting on an assembly-line basis which results in a minimum of exposure of sod or sprigs. Though rhizomes and stolons are hardy, care needs to be taken in any sodding operation to keep them from drying, freezing, heating, or molding, depending upon the weather. If the plants are not actually killed by these factors, they will be weakened and heavy losses will occur later on.**

Above: **This Bermuda-grass pasture supports fine, high-producing Jerseys. It is owned by Orrin D. Stevens, Clarksville, Texas, a cooperator in the Red River Soil Conservation District. Some farmers have used crotalaria as the soil improvement crop in conjunction with grass planting and have found that their livestock graze Bermuda-grass and refuse the volunteer crotalaria. Dallis grass and white Dutch and Persian clover also have been used in mixture.**

Below: **This Bermuda-grass waterway which receives terrace water from two sides was established by Everett Bass, a cooperator in the Soil Conservation District at Elk City, Oklahoma. He uses this waterway as a permanent pasture area. Bermuda-grass was used at the lower end of the waterway to stabilize a flume, carrying water safely to the road culvert. Some farmers use waterways for hay production.**

Above: **The first season's growth of Bermuda-grass from a seeding made in May 1944, by J. D. Bogard, cooperator with the Gaines Creek Soil Conservation District in Oklahoma.**

Below: **The Moore Brothers, cooperators in the Brazos-Robertson Soil Conservation District of Bryan, Texas, have established sound land use on a large acreage that cannot be safely row-cropped.**

AMERICAN POTASH INSTITUTE

Appoints New President

WITH the advent of the new year, the American Potash Institute named Dr. H. B. Mann as its new President and Chairman of the Board of Directors, following the retirement of Dr. J. W. Turrentine from those positions on January 1. Since the announcement proved of much interest in the agricultural circles where these men are well known, it seems fitting to present here brief biographies for others of our readers who may have known them only through the pages of this magazine.

H. B. MANN

Harvey Blount Mann was born in Hyde County, North Carolina, the son of T. J. and the late Ella Gibbs Mann. He attended the Lake Landing High School; received his B.S. degree in Agriculture in 1920 and his M.S. in Soils in 1925, both at the North Carolina State College. A Ph.D. in Agronomy was conferred upon him in 1929 by Cornell University. He served as Assistant Agronomist at North Carolina State College from 1920 to 1929 and as Agronomist from 1929 to 1936, when he left to become Assistant Southern Manager for the American Potash Institute. That same year, upon the death of J. N. Harper, he was made Southern Manager, in which position he served until becoming Vice-president of the Institute in 1948.

Regarding his scientific background, Dr. R. Y. Winters, Research Coordinator of the U. S. Department of Agriculture, has this to say: "As Director of the North Carolina Agricultural Experiment Station, I had occasion to review and approve Dr. Mann's research projects, to observe his work in the field, and to read his reports on soil fertility and plant nutrition studies during the period of 1923 to 1936. Dr. Mann was engaged in early studies of the more concentrated fertilizers, the influence of mineral supplements, and the relation of fertilizer placement to crop stand, growth, and production. The success of this work in North Carolina was due in large measure to Dr. Mann's careful planning and execution of the work. His careful notes during the season made possible more accurate analyses of results and contributed to more positive conclusions.

"Dr. Mann demonstrated his ability to do original research in his studies of calcium and magnesium relationships to the availability of manganese and iron. His controlled studies of the use of calcium by peanuts helped explain differences in response of peanuts to gypsum and calcium. His findings in this field have changed the practice of supplying lime to peanuts in North Carolina.

"As Manager of the Southern Territory of the American Potash Institute, Dr. Mann conducted the promotional program in strict accordance with fertilizer recommendations of the State Experiment Stations and the U. S. Department of Agriculture. In the administration of this program, he has been generous and discreet in the promotion of plant nutritional research in the Southern region through research fellowship grants to agricultural colleges of the region. He has maintained the respect and confidence of the State and Federal agricultural agencies of the region."

Dr. Mann is author or co-author of 35 Federal and State bulletins and articles presenting the result of original work. Included among these are some 20 publications based on original agronomic work with such crops as wheat, cotton,

H. B. MANN

corn, cow-peas, oats, rye, vetch, crimson clover, alfalfa, soybeans, peanuts, sweet potatoes, Irish potatoes, forage crops, beans, tobacco, truck crops, and peaches and their response to various plant nutrients such as nitrogen, phosphorus, potassium, lime, manganese, iron, etc. in varying combinations, ratios, and methods of application and as influenced by soil types, rotations, etc.

As Southern Manager for the American Potash Institute, he was in charge of Institute activities in the States of North Carolina, South Carolina, Georgia, Florida, Alabama, Louisiana, Mississippi, Arkansas, Texas, Oklahoma, and Tennessee. In this work he directed a staff of six field agronomists in the planning and supervision of numerous agronomic research projects and demonstrations with a wide diversity of crops as grown on many varying soil types under the several climatic conditions of that great agricultural area.

Dr. Mann is a member of the American Society of Agronomy; Soil Science Society of America; Fertilizer Committee and Sub-committee on Fertilizer Ratios; National Joint Committee on Fertilizer Application, Chairman, Southern Regional Committee; National Soil Science Society of Florida; American Association for the Advancement of Science (Fellow); Southern Agricultural Workers; Sigma Xi; Sigma Pi; Alpha Zeta; Cosmos Club of Washington; Atlanta Athletic Club; and is a Scottish Rite Mason, Shriner. In 1935 he was a delegate to the Third International Soil Congress, Oxford University, England, and he has visited the universities and experiment stations of England, Scotland, Wales, Holland, Germany, and France. He is listed in American Men of Science; Rus; International Blue Book; Chemical Who's Who, Vol. 2, 1937; and America's Young Men, Vols. 2 and 3.

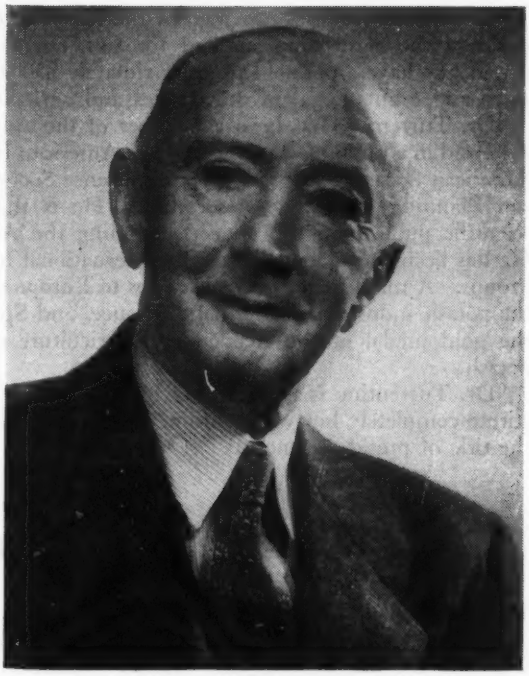
He is married to Margaret Emma Mann of Middletown, North Carolina, and they have one son, Harvey, Jr., now a student at North Carolina State College.

J. W. TURRENTINE

The December 13, 1948, issue of the CHEMICAL AND ENGINEERING NEWS published by the American Chemical Society paid tribute to Dr. Turrentine upon his retirement, with his picture on the front cover and the following write-up on page 3683:

"When John William Turrentine retires as President and Chairman of the Board of Directors of the American Potash Institute on December 31, he could

well rest on the laurels earned in a lifetime of service to the users and producers of potash. Undoubtedly, he will not be content to do so, for the growth of the American potash industry has been too closely allied with his career.



J. W. TURRENTINE

"He was born in Burlington, North Carolina, July 5, 1880, and attended the University of North Carolina, receiving a Ph.B. in 1901 and an M.S. in 1902. After teaching chemistry at Lafayette College for the next three years, he went to Cornell University and received a Ph.D. in 1908. He was serving as an instructor in chemistry at Wesleyan University in Connecticut when . . . in 1911, he joined the Department of Agriculture as a research chemist. Just prior thereto Congress had made its first appropriation for potash research and the first assignment given Dr. Turrentine was an investigation of known potash raw materials with a view toward removing the dependence of this country on Germany for potash salts.

"With the outbreak of war in 1914, imports from Germany ceased, and the price of potash jumped 1,000%. To meet the demand all known potash raw materials were placed in production. To Dr. Turrentine fell the task of designing, constructing, and operating a plant for the extraction of potash from kelp, which his earlier investigations had shown to contain large percentages of potash salts. An important feature of the plant was the process invented by Dr. Turrentine for the vacuum cooling and crystallization of potash salts. This development revolutionized the potash industry, which had previously used vat cooling and crystallizing methods. To make the plant an economic reality, Dr. Turrentine designed operations so as to obtain iodine and decolorizing carbon as by-products. In this connection he developed the blowing-out process for recovering iodine from dilute solution, a method subsequently used commercially for iodine and bromine recovery.

"Soon after the war ended, the plant was abandoned, and in 1922 Dr. Turrentine was back in Washington to take charge of government potash studies. With the founding of the American Potash Institute in 1935, he became President and Chairman of the Board of Directors.

"The Institute was founded by American potash producers and importers as a scientific research and educational publicity organization. Its purpose, according to Dr. Turrentine, is to 'find the proper scientific place for potash in American agriculture.' The Institute, through its five branch managers and 10 field agronomists, works closely with State and Federal agricultural agencies.

"Among the facilities provided by the Institute, Dr. Turrentine takes particular pride in the funds appropriated for fundamental research, which during his presidency have amounted to approximately $500,000 applied to research fellowships and grants-in-aid to universities and agricultural colleges.

"Dr. Turrentine has been a member of the American Chemical Society since 1902 and in addition is a member of the American Institute of Chemical Engineers, American Society of Agronomy, Soil Science Society of America, and the American Planning and Civic Association. He is the author of many books and scientific publications on potash, including the ACS monograph on that topic. He has been a frequent delegate to international meetings of chemical and allied groups. A major objective of his trips to Europe was to familiarize himself with the potash industries of Germany, France, and Spain. In 1937 he was awarded the gold medal of the Academie d'Agriculture de France for his work with potash.

"Dr. Turrentine is not severing his connection with the American Potash Institute completely but will continue to serve in the capacity of a consultant with the title of president emeritus."

Climate and Vitamin Content

WHEN your bean plants have suffered from lack of water they will produce beans of higher vitamin content but lower appetite appeal than beans from plants that have received adequate moisture for good growth, horticulturists of the Florida Agricultural Experiment Station revealed recently. As the average vitamin content of beans is very good and as bean plants that receive adequate moisture produce heavier crops of much higher appetite appeal than those that manage to get along despite skimpy moisture supplies, the farmer should hope for or, if necessary and possible, provide for adequate moisture for his plants.

Dr. Byron Janes and Victor Nettles found that beans receiving no irrigation contained 22.4 milligrams of ascorbic acid or vitamin C per 100 grams and 0.44 milligrams of carotene or provitamin A per 100 grams, while beans that were heavily irrigated contained only 16 milligrams of vitamin C and 0.19 milligrams of provitamin A per 100 grams.

Dr. Janes also has found a definite relationship between vitamin content of certain vegetables and the seasons in which they are produced. For example, broccoli grown at the Experiment Station in the late spring contained approximately 50 per cent more carotene than broccoli grown in the winter on the same soil with the same fertilization. Broccoli harvested in January contained 0.81 milligrams of carotene per 100 grams, while that harvested in April had 1.20 milligrams per 100 grams.

In his research on the nutritive value of Florida vegetables, Dr. Janes has come to the conclusion that growing conditions, such as rainfall, light, and temperature, have a strong bearing on the vitamin content of crops. Climate has a much stronger influence than soil on crop composition. "The only time in which soil has much effect on the organic composition of crops is when the plant makes very poor growth from excessive acid, lime, or other substances such as fertilizer and salt," he says. "A soil which will produce a normal crop will produce one which has a composition characteristic of the particular vegetable. The fact that the plant has grown healthily indicates that it has been supplied with everything necessary for life." . . . . *Clyde Beale, Agricultural Extension Service, Gainesville, Florida.*

Season Average Prices Received by Farmers for Specified Commodities *

Crop Year	Cotton Cents per lb.	Tobacco Cents per lb.	Potatoes Cents per bu.	Sweet Potatoes Cents per bu.	Corn Cents per bu.	Wheat Cents per bu.	Hay Dollars per ton	Cottonseed Dollars per ton	Truck Crops
	Aug.-July	...	July-June	July-June	Oct.-Sept.	July-June	July-June	July-June	..
Av. Aug. 1909–July 1914	12.4	10.0	69.7	87.6	64.2	88.4	11.87	22.55	....
1923	28.7	19.0	92.5	120.6	82.5	92.6	13.08	41.23	....
1924	22.9	19.0	68.6	149.6	106.3	124.7	12.66	33.25	....
1925	19.6	16.8	170.5	165.1	69.9	143.7	12.77	31.59	....
1926	12.5	17.9	131.4	117.4	74.5	121.7	13.24	22.04	....
1927	20.2	20.7	101.9	109.0	85.0	119.0	10.29	34.83	....
1928	18.0	20.0	53.2	118.0	84.0	99.8	11.22	34.17	....
1929	16.8	18.3	131.6	117.1	79.9	103.6	10.90	30.92	....
1930	9.5	12.8	91.2	108.1	59.8	67.1	11.06	22.04	....
1931	5.7	8.2	46.0	72.6	32.0	39.0	8.69	8.97	....
1932	6.5	10.5	38.0	54.2	31.9	38.2	6.20	10.33	....
1933	10.2	13.0	82.4	69.4	52.2	74.4	8.09	12.88	....
1934	12.4	21.3	44.6	79.8	81.5	84.8	13.20	33.00	....
1935	11.1	18.4	59.3	70.3	65.5	83.2	7.52	30.54	....
1936	12.4	23.6	114.2	92.9	104.4	102.5	11.20	33.36	....
1937	8.4	20.4	52.9	82.0	51.8	96.2	8.74	19.51	....
1938	8.6	19.6	55.7	73.0	48.6	56.2	6.78	21.79	....
1939	9.1	15.4	69.7	74.9	56.8	69.1	7.94	21.17	....
1940	9.9	16.0	54.1	85.5	61.8	68.2	7.58	21.73	....
1941	17.0	26.4	80.7	94.0	75.1	94.4	9.67	47.65	....
1942	19.0	36.9	117.0	119.0	91.7	110.0	10.80	45.61	....
1943	19.9	40.5	131.0	204.0	112.0	136.0	14.80	52.10	....
1944	20.7	42.0	149.0	192.0	109.0	141.0	16.40	52.70	....
1945	22.5	36.6	143.0	204.0	127.0	150.0	15.10	51.10	....
1946	32.6	38.2	122.0	218.0	156.0	191.0	16.70	71.90	....
1947	31.3	38.0	156.0	215.0	235.0	241.0	17.30	85.40	....
1948									
January	33.14	45.9	186.0	217.0	246.0	281.0	18.70	95.10	....
February	30.71	38.5	193.0	231.0	192.0	212.0	19.60	88.60	....
March	31.77	29.6	196.0	237.0	211.0	221.0	19.70	87.90	....
April	34.10	31.2	209.0	240.0	219.0	229.0	19.40	89.40	....
May	35.27	40.1	196.0	244.0	216.0	222.0	18.30	90.70	....
June	35.22	41.7	187.0	246.0	216.0	211.0	17.90	92.20	....
July	32.99	43.6	166.0	262.0	202.0	203.0	18.20	96.00	....
August	30.41	47.4	158.0	265.0	191.0	196.0	17.80	76.60	....
September	30.94	46.7	153.0	232.0	178.0	197.0	18.00	68.10	....
October	31.07	50.6	142.0	207.0	138.0	198.0	18.40	63.70	....
November	30.52	42.8	144.0	198.0	121.0	204.0	18.40	69.00	....
December	29.63	45.7	154.0	219.0	123.0	205.0	19.10	68.80	....
Index Numbers (Aug. 1909—July 1914 = 100)									
1923	231	190	133	137	129	105	110	183	....
1924	185	190	98	170	166	141	107	147	143
1925	158	168	245	188	109	163	108	140	143
1926	101	179	189	134	116	138	112	98	139
1927	163	207	146	124	132	135	87	154	127
1928	145	200	76	134	131	113	95	152	154
1929	135	183	189	133	124	117	92	137	137
1930	77	128	131	123	93	76	93	98	129
1931	46	82	66	83	50	44	73	40	115
1932	52	105	55	62	50	43	52	46	102
1933	82	130	118	79	81	84	68	57	91
1934	100	213	64	91	127	96	111	146	95
1935	90	184	85	80	102	94	63	135	119
1936	100	236	164	106	163	116	94	148	104
1937	68	204	76	93	81	109	74	87	110
1938	69	196	80	83	76	64	57	97	88
1939	73	154	100	85	88	78	67	94	91
1940	80	160	78	97	96	77	64	96	111
1941	137	264	116	107	117	107	81	211	129
1942	153	369	168	136	143	124	91	202	163
1943	160	405	188	232	174	154	125	231	245
1944	167	420	214	219	170	160	138	234	212
1945	181	366	205	232	198	170	127	227	224
1946	263	382	175	249	212	209	141	319	204
1947	252	380	224	245	366	273	146	379	249
1948									
January	267	459	267	247	383	318	158	422	320
February	248	385	277	263	299	240	165	393	320
March	256	296	281	270	329	250	166	390	295
April	275	312	300	273	341	259	163	396	340
May	284	401	281	278	336	251	154	402	262
June	284	417	268	280	336	239	151	409	213
July	266	436	238	298	315	230	153	428	213
August	245	474	227	302	298	222	150	340	172
September	250	467	220	264	277	223	152	302	150
October	251	506	204	236	215	224	155	282	176
November	246	428	207	226	188	231	155	306	186
December	239	457	220	250	192	232	161	305	209

Wholesale Prices of Ammoniates

	Nitrate of soda bulk per unit N	Sulphate of ammonia bulk per unit N	Cottonseed meal S. E. Mills per unit N	Fish scrap, dried 11–12% ammonia, 15% bone phosphate, f.o.b. factory, bulk per unit N	Tankage 11% ammonia, 15% bone phosphate, f.o.b. Chicago, bulk, per unit N	High grade ground blood, 16–17% ammonia, Chicago, bulk, per unit N
1910–14	$2.68	$2.85	$3.50	$3.53	$3.37	$3.52
1924	2.99	2.44	5.87	5.02	3.60	4.25
1925	3.11	2.47	5.41	5.34	3.97	4.75
1926	3.06	2.41	4.40	4.95	4.36	4.90
1927	3.01	2.26	5.07	5.87	4.32	5.70
1928	2.67	2.30	7.06	6.63	4.92	6.00
1929	2.57	2.04	5.64	5.00	4.61	5.72
1930	2.47	1.81	4.78	4.96	3.79	4.58
1931	2.34	1.46	3.10	3.95	2.11	2.46
1932	1.87	1.04	2.18	2.18	1.21	1.36
1933	1.52	1.12	2.95	2.86	2.06	2.46
1934	1.52	1.20	4.46	3.15	2.67	3.27
1935	1.47	1.15	4.59	3.10	3.06	3.65
1936	1.53	1.23	4.17	3.42	3.58	4.25
1937	1.63	1.32	4.91	4.66	4.04	4.80
1938	1.69	1.38	3.69	3.76	3.15	3.53
1939	1.69	1.35	4.02	4.41	3.87	3.90
1940	1.69	1.36	4.64	4.36	3.33	3.39
1941	1.69	1.41	5.50	5.32	3.76	4.43
1942	1.74	1.41	6.11	5.77	5.04	6.76
1943	1.75	1.42	6.30	5.77	4.86	6.62
1944	1.75	1.42	7.68	5.77	4.86	6.71
1945	1.75	1.42	7.81	5.77	4.86	6.71
1946	1.97	1.44	11.04	7.38	6.60	9.33
1947	2.50	1.60	12.72	10.66	12.63	10.46
1948						
January	2.78	1.83	16.22	11.71	12.75	13.28
February	2.78	1.90	15.03	12.15	12.75	12.60
March	2.78	1.90	13.68	12.06	12.75	9.47
April	2.78	1.90	13.87	11.71	12.75	8.35
May	2.78	1.90	13.77	9.54	12.75	7.89
June	2.78	1.90	14.69	9.11	8.23	8.24
July	2.78	2.07	14.56	9.22	8.80	8.73
August	2.91	2.10	10.91	9.76	8.92	8.98
September	3.00	2.20	10.70	9.87	9.18	9.03
October	3.00	2.20	9.31	9.98	9.41	9.48
November	3.00	2.20	11.00	10.31	10.44	10.68
December	3.00	2.20	11.52	11.65	11.39	11.46
Index Numbers (1910-14 = 100)						
1924	111	86	168	142	107	121
1925	115	87	155	151	117	135
1926	113	84	126	140	129	139
1927	112	79	145	166	128	162
1928	100	81	202	188	146	170
1929	96	72	161	142	137	162
1930	92	64	137	141	12	130
1931	88	51	89	112	63	70
1932	71	36	62	62	36	39
1933	59	39	84	81	97	71
1934	59	42	127	89	79	93
1935	57	40	131	88	91	104
1936	59	43	119	97	106	131
1937	61	46	140	132	120	122
1938	63	48	105	106	93	100
1939	63	47	115	125	115	111
1940	63	48	133	124	99	96
1941	63	49	157	151	112	126
1942	65	49	175	163	150	192
1943	65	50	180	163	144	189
1944	65	50	219	163	144	191
1945	65	50	223	163	144	191
1946	74	51	315	209	196	265
1947	93	56	363	302	374	297
1948						
January	104	64	463	332	378	377
February	104	67	429	344	378	358
March	104	67	391	342	378	269
April	104	67	396	332	378	237
May	104	67	393	270	378	224
June	104	67	420	258	244	234
July	104	73	416	261	261	248
August	109	74	312	276	265	255
September	112	77	306	280	272	257
October	112	77	266	283	279	269
November	112	77	314	292	310	303
December	112	77	329	330	338	326

Wholesale Prices of Phosphates and Potash **

	Superphosphate Baltimore, per unit	Florida land pebble 68% f.o.b. mines, bulk, per ton	Tennessee phosphate rock, 75% f.o.b. mines, bulk, per ton	Muriate of potash bulk, per unit, c.i.f. Atlantic and Gulf ports[1]	Sulphate of potash in bags, per unit, c.i.f. Atlantic and Gulf ports[1]	Sulphate of potash magnesia, per ton, c.i.f. Atlantic and Gulf ports[1]	Manure salts bulk, per unit, c.i.f. Atlantic and Gulf ports[1]
1910–14	$0.536	$3.61	$4.88	$0.714	$0.953	$24.18	$0.657
1924	.502	2.31	6.60	.582	.860	23.72	.472
1925	.600	2.44	6.16	.584	.860	23.72	.483
1926	.598	3.20	5.57	.596	.854	23.58	.537
1927	.525	3.09	5.50	.646	.924	25.55	.586
1928	.580	3.12	5.50	.669	.957	26.46	.607
1939	.609	3.18	5.50	.672	.962	26.59	.610
1930	.542	3.18	5.50	.681	.973	26.92	.618
1931	.485	3.18	5.50	.681	.973	26.92	.618
1932	.458	3.18	5.50	.681	.963	26.90	.618
1933	.434	3.11	5.50	.662	.864	25.10	.601
1934	.487	3.14	5.67	.486	.751	22.49	.483
1935	.492	3.30	5.69	.415	.684	21.44	.444
1936	.476	1.85	5.50	.464	.708	22.94	.505
1937	.510	1.85	5.50	.508	.757	24.70	.556
1938	.492	1.85	5.50	.523	.774	15.17	.572
1939	.478	1.90	5.50	.521	.751	24.52	.570
1940	.516	1.90	5.50	.517	.730	24.75	.573
1941	.547	1.94	5.64	.522	.780	25.55	.367 [1]
1942	.600	2.13	6.29	.522	.810	25.74	.205
1943	.631	2.00	5.93	.522	.786	25.35	.195
1944	.645	2.10	6.10	.522	.777	25.35	.195
1945	.650	2.20	6.23	.522	.777	25.35	.195
1946	.671	2.41	6.50	.508	.769	24.70	.190
1947	.746	3.05	6.60	.498	.706	18.93	.195
1948							
January	.760	3.42	6.60	.375	.669	14.50	.200
February	.760	3.42	6.60	.375	.669	14.50	.200
March	.760	3.42	6.60	.375	.669	14.50	.200
April	.760	4.11	6.60	.375	.669	14.50	.200
May	.760	4.61	6.60	.375	.669	14.50	.200
June	.760	4.61	6.60	.330	.634 [1]	12.76 [1]	.176
July	.770	4.61	6.60	.353	.676	13.63	.188
August	.770	4.61	6.60	.353	.678	13.63	.188
September	.770	4.61	6.60	.353	.678	13.63	.188
October	.763	4.61	6.60	.375	.720	14.50	.200
November	.770	4.61	6.60	.375	.720	14.50	.200
December	.770	4.61	6.60	.375	.720	14.50	.200

Index Numbers (1910-14 = 100)

1924	94	64	135	82	90	98	72
1925	110	68	126	82	90	98	74
1926	112	88	114	83	90	98	82
1927	100	86	113	90	97	106	89
1928	108	86	113	94	100	109	92
1929	114	88	113	94	101	110	93
1930	101	88	113	95	102	111	94
1931	90	88	113	95	102	111	94
1932	85	88	113	95	101	111	94
1933	81	86	113	93	91	104	91
1934	91	87	110	68	79	93	74
1935	92	91	117	58	72	89	68
1936	89	51	113	65	74	95	77
1937	95	51	113	71	79	102	85
1938	92	51	113	73	81	104	87
1939	89	53	113	73	79	101	87
1940	96	53	113	72	77	102	87
1941	102	54	110	73	82	106	87
1942	112	59	129	73	85	106	84
1943	117	55	121	73	82	105	83
1944	120	58	125	73	82	105	83
1945	121	61	128	73	82	105	83
1946	125	67	133	71	81	102	82
1947	139	84	135	70	74	78	83
1948							
January	142	95	135	68	70	60	83
February	142	95	135	68	70	60	83
March	142	95	135	68	70	60	83
April	142	114	135	68	70	60	83
May	142	128	135	68	70	60	83
June	142	128	135	62	67	53	80
July	144	128	135	65	71	56	82
August	144	128	135	65	71	56	82
September	144	128	135	65	71	56	82
October	142	128	135	68	76	60	83
November	144	128	135	68	76	60	83
December	144	128	135	68	76	60	83

Combined Index Numbers of Prices of Fertilizer Materials, Farm Products and All Commodities

	Farm prices*	Prices paid by farmers for commodities bought*	Wholesale prices of all commodities†	Fertilizer material‡	Chemical ammoniates	Organic ammoniates	Superphosphate	Potash**
1924	143	152	143	103	97	125	94	79
1925	156	156	151	112	100	131	109	80
1926	146	155	146	119	94	135	112	86
1927	142	153	139	116	89	150	100	94
1928	151	155	141	121	87	177	108	97
1929	149	154	139	114	79	146	114	97
1930	128	146	126	105	72	131	101	99
1931	90	126	107	83	62	83	90	99
1932	68	108	95	71	46	48	85	99
1933	72	108	96	70	45	71	81	95
1934	90	122	109	72	47	90	91	72
1935	109	125	117	70	45	97	92	63
1936	114	124	118	73	47	107	89	69
1937	122	131	126	81	50	129	95	75
1938	97	123	115	78	52	101	92	77
1939	95	121	112	79	51	119	89	77
1940	100	122	115	80	52	114	96	77
1941	124	131	127	86	56	130	102	77
1942	159	152	144	93	57	161	112	77
1943	192	167	151	94	57	160	117	77
1944	195	176	152	96	57	174	120	76
1945	202	180	154	97	57	175	121	76
1946	233	202	177	107	62	240	125	75
1947	278	246	222	130	74	362	139	72
1948								
January	307	266	242	139	83	403	142	71
February	279	263	233	139	85	393	142	71
March	283	262	233	137	85	379	142	71
April	291	264	238	137	85	380	142	71
May	289	265	239	137	85	370	142	71
June	295	266	241	128	85	309	142	65
July	301	266	247	231	88	317	144	68
August	293	266	247	129	91	285	144	68
September	290	265	247	131	94	287	144	68
October	277	263	243	130	94	277	142	72
November	271	261	240	134	94	311	144	72
December	268	261	239	137	94	336	144	72

* U. S. D. A. figures. Beginning January 1946 farm prices and index numbers of specific farm products revised from a calendar year to a crop-year basis. Truck crops index adjusted to the 1924 level of the all-commodity index.

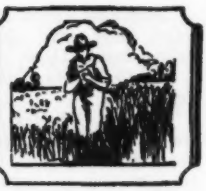
† Department of Labor index converted to 1910-14 base.

‡ The Index numbers of prices of fertilizer materials are based on original study made by the Department of Agricultural Economics and Farm Management, Cornell University, Ithaca, New York. These indexes are complete since 1897. The series was revised and reweighted as of March 1940 and November 1942.

[1] All potash salts now quoted F.O.B. mines only: manure salts since June 1941, other carriers since June 1947.

** **The weighted average of prices actually paid for potash is lower than the annual average because since 1926 over 90% of the potash used in agriculture has been contracted for during the discount period. Since 1937, the maximum discount has been 12%. Applied to muriate of potash, a price slightly above $.471 per unit K_2O thus more nearly approximates the annual average than do prices based on arithmetical averages of monthly quotations.**

REVIEWS



This section contains a short review of some of the most practical and important bulletins, and lists all recent publications of the United States Department of Agriculture, the State Experiment Stations, and Canada, relating to Fertilizers, Soils, Crops, and Economics. A file of this department of BETTER CROPS WITH PLANT FOOD would provide a complete index covering all publications from these sources on the particular subjects named.

Fertilizers

"Supplemental List Commercial Fertilizers Registrants for the Fiscal Year Ending June 30, 1949," Bu. of Chem., State Dept. of Agr., Sacramento, Calif. FM-174, Dec. 15, 1948. (Issued subsequent to list of Aug. 26, 1948).

"Supplemental List Agricultural Minerals Registrants for the Fiscal Year Ending June 30, 1949," Bu. of Chem., State Dept. of Agr., Sacramento, Calif., Dec. 16, 1948. (Issued subsequent to list of Aug. 27, 1948).

"Nutriculture," Agr. Exp. Sta., Purdue Univ., Lafayette, Ind., S. C. 328, 1948, R. B. Withrow and A. P. Withrow.

"Commercial Fertilizers in Kentucky, 1947, Including a Report on Official Fertilizer Samples Analyzed July-December, 1947," Agr. Exp. Sta., Univ. of Ky., Lexington, Ky., Reg. Bul. 65, Oct. 1948.

"Phosphate Fertilizers—Kinds and Relative Values," Agr. Ext. Div., Univ. of Ky., Lexington, Ky., Ext. Leaflet 114, Sept. 1947, P. E. Karraker and J. F. Freeman.

"A New Fertilizer for Louisiana Farmers," Agr. Ext. Div., La. State Univ., Baton Rouge, La., Ext. Leaflet 19, March 1948, Leland Morgan and Mansel Mayeux.

"Fertility Requirements of a 'Bumper' Crop," Div. of Soils, Univ. of Minn., St. Paul, Minn., C. O. Rost.

"Fertilizer Inspection and Analysis; Fall 1947," Agr. Exp. Sta., Univ. of Mo., Columbia, Mo., Bul. 516, July 1948.

"New Hampshire Grade-Tonnage Survey for the Fiscal Year July 1, 1947 to June 30, 1948," Agr. Exp. Sta., Durham, N. H., Ford S. Prince.

"Commercial Fertilizers in 1947-48," Dept. of Agron., Texas A & M College, College Station, Texas, Bul. 705, Sept. 1948, J. F. Fudge and T. L. Ogier.

"The Fertilizer Situation for 1948-49," Prod. and Mktg. Admin., U.S.D.A., Washington, D. C., Oct. 1948.

"Liquid Ammonia as a Fertilizer," Bu. of Plant Industry, Soils, and Agr. Eng., Agr. Research Admin., U.S.D.A., Beltsville, Md., 1948, M. S. Anderson.

Soils

"The Forest Soils of Connecticut," Agr. Exp. Sta., New Haven, Conn., Bul. 523, July 1948, H. A. Lunt.

"Water Management for the Farm Conserving Soil and Water for Efficient Production of Crops and Livestock," Agr. Ext. Serv., Univ. of Mo., Columbia, Mo., Cir. 557, Apr. 1948, M. W. Clark and J. C. Wooley.

"Control of Soil Erosion on Long Island," College of Agr., Cornell Univ., Ithaca, N. Y., Ext. Bul. 744, May 1948, A. F. Gustafson, John Lamb, Jr., and H. M. Wilson.

"Investigations of Chloropicrin as a Soil Fumigant," Agr. Exp. Sta., Cornell Univ., Ithaca, N. Y., Memoir 278, Aug. 1948, F. L. Stark, Jr.

"Classification and Use South Carolina Farm Lands According to Their Capabilities," Agr. Ext. Serv., Clemson Agr. College, Clemson, S. C., Cir. 316, May 1948, The South Carolina Agronomy Committee.

"Soil, Soil Management and Soil Conservation—A Manual for Youth Groups," Agr. Ext. Serv., S. D. State College, Brookings, S. D., Ext. Cir. 436, June 1948, L. L. Ladd.

"Soil Survey—Jackson County, North Carolina," Agr. Research Admin., U.S.D.A., Washington, D. C., Series 1938, No. 19, Issued Sept. 1948, E. F. Goldston, W. A. Davis, and C. W. Croom.

"The Quality of Water for Irrigation Use," Agr. Research Admin., U.S.D.A., Washington, D. C., Tech. Bul. 962, Sept. 1948, L. V. Wilcox.

"Soil Classification Helps Fit Crops and Farming Methods to Individual Farms," Agr. Research Admin., U.S.D.A., Washington, D. C., R. A. S. 109 (P), Oct. 1948.

Crops

"The Home Garden," Ext. Serv., Ala. Polytechnic Institute, Auburn, Ala., Cir. 134, Feb. 1947 (Rev.), W. A. Ruffin.

"The Effect of Moisture Content, Field Exposure, and Processing on the Spinning Value of Arizona Upland Cotton," Agr. Exp. Sta., Univ. of Ariz., Tucson, Ariz., Tech. Bul. 115, June 1948, R. S. Hawkins and W. I. Thomas.

"Oats in Canada," Exp. Farms Serv., Dept. of Agr., Ottawa, Ont., Can., Publ. 554, Farmers' Bul. 27 (Rev.) 1948, R. A. Derick and D. G. Hamilton.

"Dominion Forest Nursery Stations—Indian Head, Sask. and Sutherland, Sask," Exp. Farms Serv., Dept. of Agr., Ottawa, Can., P. R. 1937-1946, John Walker and W. L. Kerr.

"Culture of Barley in Colorado," Agr. Exp. Sta., Colo. A & M College, Fort Collins, Colo., Tech. Bul. 39, June 1948, D. W. Robertson, Dwight Koonce, Rodney Tucker, J. F. Brandon, and T. E. Haus.

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"Upland Permanent Pastures for the Coastal Plain of Georgia," Ga. Coastal Plain Exp. Sta., Tifton, Ga., Mimeo Paper No. 1, June 1941, (Rev. Nov. 1948).

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"Inoculation of Legumes," Agr. Ext. Serv., Univ. of Idaho, Moscow, Idaho, Ext. Cir. 101, Oct. 1947, V. A. Cherrington and K. H. Klages.

"Irrigated Pastures," Agr. Ext. Div., Univ. of Idaho, Moscow, Idaho, Ext. Bul. 174, June 1948, K. H. Klages, R. H. Stark, G. C. Anderson, D. L. Fourt, E. W. Whitman, and T. B. Keith.

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"Fruit Varieties for Michigan," Agr. Ext. Serv., Mich. State College, East Lansing, Mich., Ext. Folder F-116, March 1948.

"Hints on Blueberry Growing," Agr. Ext. Serv., Mich. State College, East Lansing, Mich., Ext. Folder F-119, Apr. 1948.

"Currants and Gooseberries," Agr. Ext. Serv., Mich. State College, East Lansing, Mich., Ext. Folder F-120, April 1948.

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"Pruning Young Fruit Trees," Agr. Ext. Serv., Mich. State College, East Lansing, Mich., Ext. Folder F-122, Apr. 1948.

"Planning and Planting the Orchard," Agr. Ext. Serv., Mich. State College, East Lansing, Mich., Ext. Folder F-123, May 1948.

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"Crimson Clover for Better Pastures," Agr. Ext. Serv., Miss. State College, State College, Miss., Unno. Folder, W. R. Thompson.

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"A Balanced Agriculture for Missouri," Agr. Ext. Serv., Columbia, Mo., Cir. 559, Apr. 1948.

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"The Set of The Sails," 1947 A. R. of Ext. Serv., R. I. State College, Kingston, R. I., Bul. 118, May 1, 1948, H. O. Stuart.

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"Suggested Plan for the Medium Southern Piedmont Cotton Farms," Agr. Ext. Serv., Univ. of N. C., Raleigh, N. C., Ext. Cir. 320, July 1948, C. B. Ratchford.

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"Dairy Farm Earnings in Tillamook County, Oregon," Agr. Exp. Sta., Oreg. State College, Corvallis, Oreg., Sta. Bul. 450, Jan. 1948, G. W. Kuhlman, A. L. Pulliam, and D. C. Mumford.

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"Methods of Harvesting Hay Fields and Pastures in Northwestern Washington (North Coast Area), 1945," Agr. Exp. Sta., State College of Wash., Pullman, Wash., Bul. 502, April 1948, H. H. Stippler, M. T. Buchanan, and A. G. Law.

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"Workers in Subjects Pertaining to Agriculture in Land-grant Colleges and Experiment Stations, 1947-48," Office of Exp. Stations, Agr. Research Admin., U.S.D.A., Washington, D. C., Misc. Publ. 649, June 1948.

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ALL WRONG

A man who doesn't like his son-in-law confided in a friend, "He can't drink and he can't play cards."

"Fine," said the friend, "that's the kind of a son-in-law to have."

"No siree," objected the man. "He can't play cards—and he plays. He can't drink—and he drinks."

NO FOOLING

The prisoner was worried when he saw twelve women in the jury box. He asked his lawyer, "Do I have to be tried by a woman jury?"

"Be still," whispered his attorney.

"I won't be still," replied the man. "If I can't fool my own wife, how in the h - - - can I fool twelve strange women?"

Establishing Bermuda-grass

(*From page* 25)

Bermuda-grass usually responds to a supply of potash in the fertilizer. Manure is good, but generally causes unusually heavy weed competition.

6. Seed after warm weather starts. Seeding after mean daily temperatures reach 65 degrees F. is most successful in Arkansas.

7. Keep new seeding as weed-free as possible. Cultivation may be necessary, and a limited amount of grazing after stolons have started to run will help keep competing vegetation down and encourage crowning. Cultivation and grazing should be discontinued, however, when the stolons have completed most of their first season's growth to allow plenty of time for top growth and other vegetation to develop for winter protection.

8. Provide winter protection for first-year stolons. First-year seedlings normally have developed no rhizomes; therefore, stolons are the only source of the next year's growth. Where winter temperatures are likely to be much below freezing, special emphasis needs to be placed on keeping Bermuda-grass stolons from being killed. In milder parts of the Western Gulf Region the maintenance of a large amount of fall vegetation that will mat over the stolons and protect them may be sufficient. A month's or six weeks' deferment before frost may suffice.

In northern Arkansas and Oklahoma, stolons should receive a light covering of soil for protection. This can be done any time before hard, killing frosts. It will be more successful if done early enough to let settling and soil moisture eliminate air spaces that could carry killing air temperatures to the covered stolons. The last cultivation of the grass can be done in a way to provide the necessary stolon protection.

9. Rhizome growth should be induced as soon as possible. Bermuda-grass rhizomes resist drouth or low temperatures better than do stolons. They naturally are better protected from the elements. Disking will loosen the soil and encourage rhizome growth. This should be done the spring following the first growing season, after stolons have started growing. Disking also will uncover some stolons so that they will develop early, and will smooth the land surface for easy mowing. It will help to apply a nitrogenous fertilizer just before the rhizomes bud. This suddenly throws a large amount of plant nutrients into building these plant-food storage reservoirs. Apply this treatment the first fall and the second summer at times indicated by the beginning of seed stalk formation.

Building Permanent Pastures on a Bermuda-grass Base

It is desirable to build up Bermuda-grass pastures to produce a large amount of beef, milk, and other livestock products. The introduction of legumes and winter-growing grasses, continued application of fertilizers and, where needed, lime, and attention to the other management needs, such as mowing, occasional tillage, proper degree of utilization, and prevention of burning will make Bermuda-grass high-producing.

Before other kinds of plants are overseeded onto it, the Bermuda-grass should be well established. The desired density of the grass should have been attained and rhizome growth should have started. Plants that are seeded in the fall usually can be overseeded safely after the first growing season if sod or sprigs were used to establish the grass. Unless rhizome growth is secured the first growing season on Bermuda-grass seedings, fall overseedings should be delayed until after the second growing season. Spring overseedings usually can be made safely the second growing season on both sodded and seeded stands.

Bermuda-grass Is Used for Many Conservation Jobs

As a necessary part of farm conservation development, thousands of stock-water ponds have been constructed. Many more will be built. Most of these require the building of a dam of earth and the excavation of a spillway for excess water. Bermuda-grass is the major plant used for stabilizing both dams and spillways. Raw subsoil usually is exposed in construction, and enough fertility must be applied to get good grass growth. Topsoil often is placed on the surface to support the vegetation. Fertilizer should be applied.

Waterways

The concentrated flow from field terraces must be carried safely to areas of stable grade. Whenever terraces can be emptied onto broad vegetated waterways it can be led slowly and safely to stable natural drains.

Channels

Occasionally terrace water must be taken to stable grades through designed channels, rather than preferred broad meadow or pasture waterways. Bermuda-grass is the chief vegetative stabilizer for channels. It is very important that it be kept closely cropped, since then it is considerably more efficient in protecting soil against rapid surface flow.

Highway Erosion Control and Safety

The Soil Conservation Service, soil conservation districts, and state highway departments have been developing effective means of stopping the large amount of erosion on road right-of-ways. Erosion control, highway beautification, and highway safety all require widespread use of Bermuda-grass. The application of a generous mulch of sprigs, mixed with good topsoil, is an economical and effective way of establishing Bermuda-grass along highways. The mulch is rolled and kept watered, if necessary.

Useful Figures about Bermuda-grass

Approx. Number Unhulled Seed (florets) per pound . . . 1,500,000
Approx. Number Hulled Seed (caryopses) per pound 2,000,000
Average Purity of Seed 94.35%
Average Germination of Seed . . . 73.2%
Average Longevity of Seed . . 2-3 years
Approx. Weight of Seed per bushel . . . . . 25 lbs.
Seeding Rate, Hulled Seed, 100% purity, 100% germination to secure 20 live, pure seed per square foot—per acre . . . . . 0.6 lbs.
(Add 1/10 lb. for each 10% drop in either purity or germination, to 70%)
Sprigs, without Soil or Top Growth, to Plant 1 acre, firmed . . . . . 8-10 bu.
Fat Content (from Texas Agricultural Experiment Station) . . 1.5%
Phosphoric Acid, before July 1,—on Phosphated Soils 0.55%
Phosphoric Acid, before July 1,—Phosphate not applied 0.41%
Phosphoric Acid, after September 1,—on Phosphated Soils 0.47%
Phosphoric Acid, after September 1,—Phosphate not applied 0.34%
(Foregoing data from Texas Agricultural Experiment Station)
Crude Protein—without Winter Clovers in Mixture . . . 5.19%
Crude Protein—with White Clover 5.38%
Crude Protein—with Persian Clover 6.38%
Crude Protein—with Hop Clover 7.31%
Crude Protein—with Cluster Clover 8.31%
(Foregoing protein data from Georgia Agricultural Experiment Station)
Calcium Content (from regional data) 0.48%
Dry Weight Annual Production, without Winter Clover . . . . 1,629 lbs.
Dry Weight Annual Production, with Winter Clover . . . . . 3,238 lbs.
(Foregoing data from Georgia

Agricultural Experiment Station)
Annual Yield of Hay (from regional data) ..... 1-2 tons
Annual Production, 4% Milk, per acre.... from 7,404 lbs. to 11,434 lbs. (From South Carolina Agricultural Experiment Station)
Annual Production of Beef, per acre..... from 266 lbs. to 381 lbs. (Experiment Station Averages, Arkansas)
Rainfall Lost Annually, per acre, from Bermuda-grass Sod (Batesville, Arkansas)..... 0.89 in.
Soil Lost Annually, per acre, from Bermuda-grass Sod (15-year period at Guthrie, Oklahoma) .016 tons

Military Kudzu

(*From page* 18)

400 pounds of 0-14-10 or 300 pounds of 0-20-20, if available, would be suitable. As the number of animal units on such an area increases, a general fertilization will have to be given and an additional application made on those areas where intensive grazing is desired. The cattle will find the more highly fertilized areas and graze them intensively.

This same program of controlled grazing with fertilizer can be extended to other grasses and legumes and mixtures.

Fort Bragg, North Carolina, has an unusual situation. A lot of kudzu has been planted for erosion control, but only a small part of the plantings have developed sufficient growth to control erosion. On the ranges practically all of the road-bank plantings have been overgrazed by deer. Under such conditions there are two alternatives: (1) Maintain the status quo; or (2) plant enough kudzu to control erosion and provide sufficient deer feed. There is enough severe erosion to be controlled over the entire reservation to require sufficient kudzu to supply both summer and winter feed for the deer population.

Under these conditions kudzu has

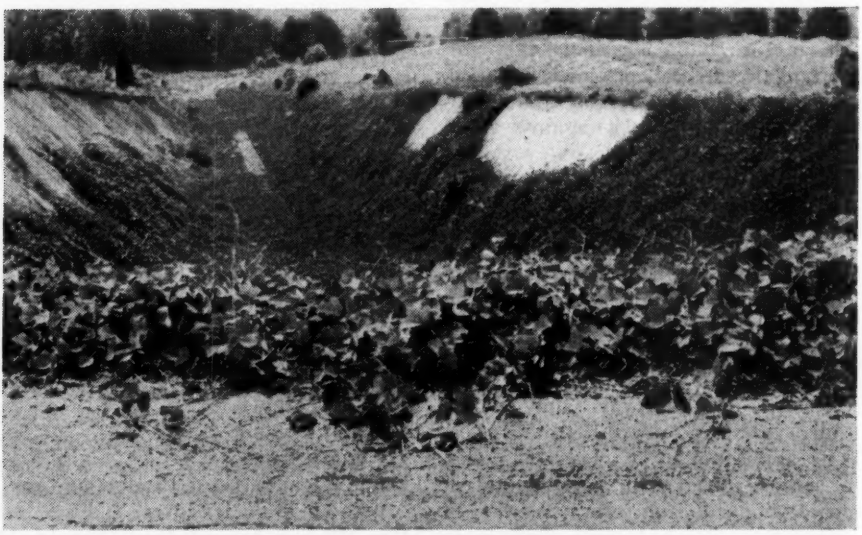

Fig. 5. The kudzu which stabilized the banks of this railroad has covered the rails and roadbed. If the tracks are used again, the kudzu will be more easily cleared than the soil eroded from the steep cut banks.

two outstanding characteristics: (1) complete erosion control; (2) high quality feed for cattle and deer.

Another long-range value is its soil-building as well as soil-holding ability. The time may come when the productive capacity of this soil may be a matter of importance. Right now erosion control will reduce road maintenance costs and prevent the complete silting of ponds. With enough kudzu planted to do a complete job of erosion control, the deer will be healthier, fatter, and probably more contented to stay on the reservation. These present benefits are sufficient to warrant the necessary plantings.

As the kudzu develops, its roots will be growing and expanding into long tubers where plant food is stored. One acre of live roots has weighed as much as 56,000 pounds. An average is 26,000 pounds, or 13 tons of organic matter per acre underground. This accounts largely for the tremendous soil building that kudzu accomplishes underground while holding the surface soil in place.

The food and feed needs are increasing. The military reservations are of sufficient size to add materially to the needed feed supplies by establishing a complete erosion control program. This will reduce maintenance costs and build soil for our future needs without curtailing present military use.

Organic Matter . . . . Old Soils

(*From page* 11)

land type of agriculture has become a part of the thinking of farmers in the Middle West. "More land in grass more of the time; some land in grass all of the time" is the slogan we use here in Wisconsin. Our Government is encouraging farmers to practice a soil-saving type of agriculture by making incentive payments for practices of fertilizing, liming, the seeding of grass and legume crops, soil-conserving tillage practices, and other control measures.

How important is organic matter? I hope that every farmer will decide upon and then carry out some improved practices on his farm that will add to the supply of humus and organic matter. Such procedure will make his land more productive, add to its capital value, and make for future prosperity for him, his family, his community, his state, and the Nation.

Hardening Plants with Potash

(*From page* 14)

ing in an extensive outdoor bed. The early part of the season had been unusually cold and rainy. As a result the plants grew very slowly, and he feared the nitrates had been leached from the soil. Consequently he applied a heavy sidedressing of nitrate of soda. Shortly thereafter the weather became unseasonably warm and his plants grew very rapidly but were making such a soft, succulent growth they would not be satisfactory for transplanting.

He was shown the previously mentioned series of tomato plants in the coldframe and noted how the high-potash fertilizer was "hardening" the plants. He was much impressed with the firm, stiff stems and stocky plants, and was advised to apply a sidedressing of muriate of potash to his cabbage plants to "harden" them. In order to get a more prompt response, because time was an essential factor, he was advised to apply the potash in solution.

Since he was equipped with a large mounted tank with tubes to apply calomel solution to his cabbage plant rows to control cabbage maggot, it was suggested that he use this equipment to apply the muriate of potash in solution directly on his cabbage rows. This was applied at the rate of 10 lbs. of 60 per cent muriate of potash per 50 gallons of water, using 750 gallons per acre.

The result was that very satisfactory plants were produced by this treatment. A few rows were left as an untreated check for comparison. The cabbage plants receiving the potash sidedressing made a stockier growth with firm stiff stems that stood transplanting well, whereas the untreated plants made such a rank soft growth they were discarded.

Similarly, plants in the field, if they are making too soft and rank a vegetative growth, can be hardened by applying potash fertilizer. If too much potash is applied an apparent nitrogen deficiency may occur.

Handling Quantities of Data

(*From page* 12)

items. Under such conditions many more minor items than customary are used in reaching the ultimate conclusion.

When all available information is punched upon the card as here shown for Bill Smith, the machine can rapidly handle most of the work necessary in making numerous studies, comparisons, calculations, or summaries.

Some computations which have already been made on the 42,000 samples tested the last fiscal year in North Carolina reveal some interesting things. For instance, using the data obtained to represent the counties and State, it was found that:

1. Ninty-three and three-tenths per cent of the topsoils submitted for analysis were accompanied with subsoil and 88.3 per cent of the topsoils were accompanied with data or history sheets from the farmer.

2. Soils were analyzed and lime and fertilizer recommendations were made for 7,526 different farmers.

3. In one county 21.6 per cent of the soils had a pH above 6.5; while in another county 29.4 per cent of the soils had a pH below 5.0.

4. In one county 17.1 per cent of the soils were very low in potassium; in another county 14.1 per cent were very high in potassium.

5. In one county 38 per cent of the soils were very high in phosphorus; in another 61.6 were very low in phosphorus.

6. In one county 44 per cent of the soils had more than 3.5 per cent organic matter; in another county 55.5 per cent of the soils had less than 1 per cent organic matter.

7. There were 2,223 farmers who submitted only one sample of soil; 3,498 who submitted two samples; and 6,890 who submitted three samples. The average for the entire state was three samples per farmer.

8. Recommendations were made for 92 different types of crops on 120 soil types.

9. There were 1,567 composite samples of soils collected according to instructions in detail, with 9,179 made up of less than five sub-samples.

10. There were 6,954 fields that had been limed, and 4,262 fields with unknown lime history.

11. More samples of soils were tested for alfalfa than for any other crop, with pasture, tobacco, and corn following in the order named.

These data emphasize the great necessity of proper sampling and should definitely stimulate those working in the education field to do more effective teaching in proper sampling. On the

other hand, the data show that most of the farmers now realize the necessity for a subsoil and data sheet with each sample of topsoil; therefore, it probably will not be necessary to place much emphasis on this part of the program in the future.

If there were not enough of any plant food available to supply all needs, then a major effort should be made to get ample quantities of that plant food to the county which is low in it rather than to the county which is reasonably high in that plant food.

The foregoing material should suffice to show the broad application of these machines in handling great masses of data.

Permanent Pastures in South Carolina

(*From page* 20)

a complete fertilizer on these pastures as compared to the untreated plots. The State Pasture Committee also visits a representative number of these demonstrations each year. Many of the present permanent pasture recommendations have been made based on studies of these demonstrations.

Notwithstanding the fact that permanent pastures furnish the cheapest feed on the farm, it must be remembered that there is no compromise for following through with the required steps in establishing a good pasture. Failure to sufficiently inoculate clover seed and to protect the inoculant with a cultipacker when seeding will usually result in failure to obtain a satisfactory stand of clover.

Patience is very necessary in establishing a permanent pasture. Good sods of grasses and legumes require several years. Once the pasture has been established, the job is not done. At this stage the proper maintenance and management begin. Neglected use of the mowing machine to control noxious weeds, overgrazing, undergrazing (although seldom occurring), and the inadequate use of plant nutrients will not contribute to keeping a pasture of high quality and production.

Indiana's Muck Crops Program

(*From page* 22)

use of such fertilizer elements as will help in the control of specific diseases.

5. Control insects by the proper use of recommended insecticides.

6. Cooperate with growers and others in the promotion of your county muck crops association, advertising the quality of northern Indiana muck crops.

7. Standardize product to meet U. S. grades, and mark accordingly.

8. Use new, clean containers for top grades, with approved identifying brands.

9. Consult your county agricultural agent when planning a muck crops program; study recommended practices and follow those fitted to crop production on your farm.

10. Market your quality products efficiently. Your produce loaded in refrigerator cars, protected against heat and cold, can reach any market in the United States in excellent condition at a minimum cost and maximum speed, and will secure the attention of the buying public.

With such a program the value of the Association can easily be recognized. The results have paid off very well for the efforts of these men who

10 years ago were up against great odds.

The 400-Bushel Potato Club is a product of the Association which was formed when very little was known of the relation of potash to the yield of potato crops. The production records of this club have been going higher each year as more experience is gained by the growers, along with better potato varieties that are developed and the added use of the all-important potash. When these things are put together with a working production program, it means only one thing and that is success.

Fig. 2. Louis Ruderman, 1948 Indiana Potato Champion, produced 717.12 bushels of U. S. No. 1's on his champion acre.

The 1948 yields of the 400-Bushel Potato Club were record-breaking; several are reported here with a few of the reasons why they were so high.

The 1948 Indiana Potato Champion is Louis Ruderman, who lives near Huntertown in Allen County. Ruderman had 35 acres of potatoes on black muck which has a pH of 5.6. He broke all records in Indiana by producing 717.12 bushels of Katahdins per acre. The previous record was set in 1947 by another muck farmer with 712.33 bushels per acre.

Ruderman's land is valued at over $300 per acre but is not for sale. It is well drained, with 235 acres in the entire field. The water level in the sub-soil is maintained at 36 to 40 inches below the surface. He used 35 bushels of certified Katahdin seed potato stock per acre.

Mr. Ruderman is a strong believer in plenty of fertilizer to insure a good crop. In 1947 he grew potatoes in the same plot and used 1,200 pounds of 0-9-27, and in spite of poor growing conditions he produced over 400 bushels per acre. This year to produce his record-breaking crop he applied 1,200 pounds of 0-8-24 per acre under the rows. A heavy green manure crop of rye four feet high was plowed under in April to aid in growing this fine crop of high quality potatoes.

Arthur Troyer of LaOtto in Noble County produced the second highest yield in the club this year, with 659.65 bushels per acre. Troyer produced his good crop by plowing under a green manure crop of rye early in the spring and applying 800 pounds of 0-9-27 fertilizer in bands on each side of the row. He maintained a water level in his soil 30 inches below the surface.

Mr. Troyer maintains that there are three major factors that can not be overlooked in producing potatoes on muck land:

1. Use good seed.
2. Apply enough high-potash fertilizer.
3. Practice an intensive spray schedule.

Joe Glancy held fifth place among the winners of the club with a yield of 632.42 bushels. Mr. Glancy manages the Indiana State Prison farm at Westville in Porter County and, like all other muck crop men, is a strong believer in the three things Troyer listed above.

There are other stories which are equally interesting that could be told but they are all similar to those of the "400-Bushel Potato Club."

Farm Listening Posts

(*From page* 5)

reports on request. In discussing his customary methods, Mr. Webster once stated:

"We watch the crops from planting time to harvest. As I get around and meet my friends at church or in town, we usually talk crops and yields and prices. Even though I am pretty old, I get out on the farm every day, so that I get a close picture of what's doing. In milk production figuring I spend much time with my son, who is manager of a creamery. He runs our farm now and when I get too old to work I'll probably turn this crop reporting duty over to him. It ought to stay in the family."

ANOTHER element of the rural population who have had much to do with correct surveys of crops and farm statistics are the elected assessors. Not all the states make use of their services in the same degree as others. Yet without extra pay these officers fill county by county record files that are sent on to the state estimators for substantial basic use.

What happens to all these individual accounts and estimates when they are dumped onto the desks of the state people?

Each day's mail around the first of each month is heavy with these uniform reports. Clerks who supervise this work get familiar with the names and contributions of the farm fieldmen. The envelopes are run through a mechanical opening machine, and the contents of them are sorted out by counties. When all the reports for all the counties are footed up on separate sheets, the "editor" and "checker" get busy. Even the best of authorities has to stand for having his copy edited. Then when these advisable adjustments are made the totals are cast up for each crop and each livestock item in the respective counties.

By putting in some extra overtime and having skilled and trained workers on the job, most of the states handle the monthly crop reports in at least four days. Like newspapers, these offices work against a time limit deadline. Certain specified dates are fixed for such data to reach national headquarters, ready to be merged and blended with the records and estimates from all the states into the final consensus of opinion. Crop panels of expert estimators scan the state reports and finally come forth with the famous release at "3 p. m. Eastern Standard time," invariably on the 10th of each month. The verbal trimmings attached thereto mean no small task either, so the pencils fly and the stencils hum, while a myriad of newshawks sit on the fence like buzzards anxious for the "kill."

NO doubt the influence of the local farmers club has waned. Its place has been largely taken by up-an-at-'em cooperatives. Yet these same social and technical farm clubs were the places where early crop reporting began. Mr. Allen Farquhar of Montgomery county, Maryland, on the celebration of the seventy-fifth anniversary of the Civil War crop report gave an insight into the invaluable help which such neighborhood assemblies provided.

He said flatly that he relied largely on the conversations and discussions of the farmers clubs for his crop estimates. It was the custom of such gatherings to have a light (?) lunch and a brief business meeting and then to walk around afield with the host of the day. He said that some of the members doubted the value of estimated crops by a scattering system of reports which

was then in vogue. The same man added, however, that if it could be arranged so that a large number of similar estimates could be collected at a central point, there might be something good come of it. And there has!

THERE was a period between the seventies and the dawn of the modern era when farm papers encouraged some of their subscribers to send in regular crop estimates and summer season condition reports. The editors mailed these volunteers plenty of paper and stamped return envelopes, and then credited them personally with their contributions when printed. I recall opening and arranging these pencil-written letters and writing suitable headlines to grab reader attention. I believe that they boasted excellent readability scores, too, because no other crop system then approached them for reliability and directness and the use of personal names induced more careful reading. But we abandoned the custom over 20 years ago, and like the wearisome detailed reports of fair awards, the crop report as such by subscribers has vanished from the farm journal index.

It was the early conclusion of farm editors and other leaders of advanced hopes on crop reporting that only the Government itself could hope to work out and perfect a good, lasting, and reliable system of crop and livestock reporting. Their belief proved true.

From time to time private agencies and grain houses have issued their own independent cereal and cotton reports. That they have been done well and represent excellent service are not debated here. Yet for downright confidence and unbiased attitude, the populace as a whole looks to the U. S. Department of Agriculture and its State crop estimating agencies for the right answer.

The confidential forecast is one thing and the public statement is another quite apart. Sometimes the trade really gets the facts faster and perhaps more accurately to inform its own clientele than the public agency, but the official estimate from Washington and the state capitals remains the "daddy of them all."

Your technical crop report reviser is a shark for work and a demon for adjustments. He takes the raw materials sent in by the working farm informers and subjects them to his craftsmanship. This means using slide rules, calipers, calculating machines, and adding mechanisms, reading dot charts, and consuming much scratch paper. The eye-shades, briar pipes, and armbands that have been worn to shreds at this mighty business of the nation would make a big rummage sale.

I boast many good friends in this polishing off of farm figures. When they are hard at it behind closed doors I do not enter, because they speak only in statistical jargon that I cannot (and care not to) understand. Neither would the loyal farm reporter quite see the light amid all this encircling haze. Yet it is advisable and necessary to the farrowing of a litter of useful information.

BUT when all is clear and the smoke lifts from the conference room, and after the well-qualified words are written and the tables stenciled, an ordinary inquiring mortal can sidle into the presence of these crop correctors and get an earful.

Here results depend on the knowledge of the farm craft displayed by the news or radio boy who enters the sanctum. If he has to have all explained to him, such as the difference between winter and spring wheat, shorn and pulled wool, fluid milk and manufactured milk, or field peas and canned peas—he won't get a scoop or a reliable feature story.

Forecasting, the "soothsaying" side of crop statistics, is another new venture begun as late as 1927 in this country.

During the first world war some army officers prevailed on the U. S. Department of Agriculture to obtain answers from farmers on intentions to sow their spring wheat. So well were these reports returned, and so closely did the results finally match the expressed intentions, that the decision to experiment further in this field was made.

It must be noted that the basic data behind the forecasts are made possible mostly by volunteer fact gathering by the rural letter carriers. Hence we must add these unsung aides to the list of persons whose public spirit enables our citizens to enjoy the best crop-reporting service there is.

BUT thanks to the continued existence of these regular crop announcements and the importance of the information they carry to many urban communities, your active news gatherer is becoming responsive and alert to what it all means. I firmly believe that the world food shortage and export boom since the end of World War II have resulted in more mass interest by newspaper and radio workers in food and farm production facts. Some of us who have them at our heels constantly can well testify to that, and then some.

At any rate, the value and confidence folks have in all these reports trace, as I have said, clear back to the farmers who use stub-pencils to give the goings on at the grass-roots. I would dislike to see them shifted over into professional economists or trained statisticians, or have the expert revisers go out after the original dope. Somehow, it would spoil this vestige of romance and individual integrity of men on the land being responsible for what comes from the land and what is reported about the land's bounty.

So I wish all of them and their busy revisers a happy New Year—a nice challenging one, not too full of figures, but with just enough to add zest and pepper to those who are the "salt of the earth."

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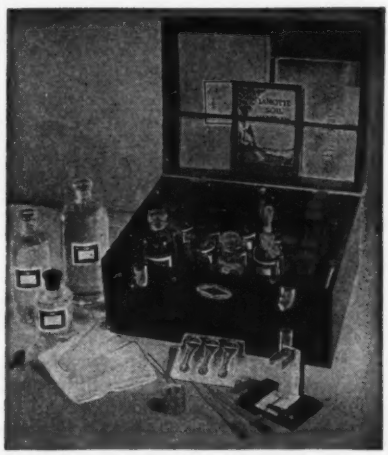

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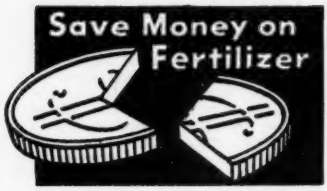

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A tall cowboy, wearing a 10-gallon hat, was sauntering around in a large department store and the salesgirl asked if she might help him. He replied:

"No ma'am, I reckon not. I ain't never seen so many things I could do without."

★ ★ ★

Teacher: "Yes, Johnny, what is it?"

Johnny: "I don't want to scare you, Miss Jones, but my father says if I don't get better grades, someone is due for a licking!"

★ ★ ★

Lovers, like all people who are blind, develop a wonderful sense of touch.

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FORESIGHT

Pat was thought to be dying. A friend at the bedside asked:

"Have you made peace with God and renounced the devil?"

"I've made peace with God," Pat answered, "but I'm in no position to antagonize anybody!"

★ ★ ★

An irate master censured his servant by saying:

Master—"Rastus, I thought I told you to get a domestic turkey. This one has shot in it."

Rastus—"But I done got a domestic turkey, sir."

Master — "Domestic? Then how come this one has shot in it?"

Rastus—" 'Cause, I don't think that shot was intended for the turkey."

Taken from a patent medicine testimonial: "Since taking your tablets regularly, I am another woman. Needless to say, my husband is delighted."

★ ★ ★

Visitor: "Do you know, there's a baby born every minute in New York?"

Friend: "Don't look at me. I live in Cincinnati."

★ ★ ★

A clergyman about to start a lecture tour asked a young reporter not to publish any of the lecture, as it might spoil the attendance at other meetings.

The following morning he read in the local paper:

"Our vicar told some excellent stories, but, unfortunately, they cannot be printed."

★ ★ ★

Maybe it is good that men don't understand women. Women understand women, and don't like them.

★ ★ ★

She was sick in bed, and her husband, who was fixing her a cup of tea, called out that he couldn't find the tea. "I don't know what could be easier to find," she answered. "It's right in front on the pantry shelf in a cocoa tin marked matches."

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"Madam, this is her maiden voyage."

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A new four-reel series of 16 mm., sound, color films which may be booked independently or in any combination. They may be used to best advantage when shown at least one day apart and in the following sequence:

THE PLANT SPEAKS THRU DEFICIENCY SYMPTOMS pictures soil depletion, erosion, and deficiency symptoms on plants. (Running time 25 min. on 800-ft. reel.)

THE PLANT SPEAKS, SOIL TESTS TELL US WHY depicts taking soil samples on the farm and the interpretation of soil tests. (Running time 10 min. on 400-ft. reel.)

THE PLANT SPEAKS THRU TISSUE TESTS shows the value of tissue testing and the procedure for testing plant tissues in the field. (Running time 14 min. on 400-ft. reel.)

THE PLANT SPEAKS THRU LEAF ANALYSIS evaluates leaves in plant growth and leaf analysis in determining fertilizer needs. (Running time 18 min. on 800-ft. reel.)

We shall be pleased to loan these films to agricultural colleges, experiment stations, county agents, vocational teachers, responsible farm organizations, and members of the fertilizer trade.

OTHER 16MM. COLOR FILMS AVAILABLE FOR TERRITORIES INDICATED

Potash in Southern Agriculture (South)
In the Clover (Northeast)
Bringing Citrus Quality to Market (West)
Machine Placement of Fertilizer (West)
Ladino Clover Pastures (West)
Potash from Soil to Plant (West)
Potash Deficiency in Grapes and Prunes (West)
New Soils from Old (Midwest)
Potash Production in America (All)
Save That Soil (All)
Borax From Desert to Farm (All)

IMPORTANT

Requests should be made *well in advance* and should include information as to group before which the film is to be shown, date of exhibition (alternative dates if possible), and period of time of loan.

American Potash Institute
1155 Sixteenth Street
Washington 6, D. C.

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